DEPARTMENT OF THE NAVY

PUGET SOUND NAVAL SHIPYARD
1400 FARRAGUT AVENUE
BREMERTON, WASHINGTON 98314-5001

IN REPLY REFER TO:
NAVSHIPYDPUGETINST P11320.1F CH-9
Code 1124
24 Apr 2003

NAVSHIPYDPUGET INSTRUCTION P11320.1F CHANGE TRANSMITTAL 9

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

Encl: (1) Revised pages vii through x, III-2-1 through III-2-4, IV-5-5, IV-5-6, VI-5-6 through VI-5-8

1. Purpose

a. To correct list of effective pages.

b. To provide requirements for vacant buildings.

c. To reflect information on operation and use of current portable fuel tanks.

d. To define restrictions of hot work operations when fire alarm systems are disconnected or impaired.

e. To define notification requirements when fire alarm systems are disconnected.

f. To clarify restriction of poly-tarps in dry docks and near heat sources.

g. To give guidance on fueling of portable, gas-powered equipment.

h. To remove conflicting statement regarding accountability of shipboard workers.

i. To change size of portable fire extinguishers from 15 pounds to 10 pounds, and change their inspection cycle from every 30 days to monthly.

j. To add lockout tagout procedure for fire hose stations.

2. Action

a. Remove pages vii through x, III-2-1 through III-2-4, IV-5-5, IV-5-6, and VI-5-5 through VI-5-8, and insert enclosure (1).

b. Make a pen change to page II-3-3, paragraph 3c(3), line 3. Change “paragraphs 6b and 6c” to “paragraph 4d(2).”

c. Make pen changes to page III-5-5. In paragraph 4c(4)(b),

first line, change “15-pound” to “10-pound.” In paragraph 4d(1), last line, change “every 30 days” to “monthly.”

d. File this change transmittal in front of the instruction as a record of authority for the change.

/s/
R. T. METZGER
By direction

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IN REPLY REFER TO:

NAVSHIPYDPUGETINST P11320.1F CH-8
Code 1124
27 Feb 2002

NAVSHIPYDPUGET INSTRUCTION P11320.1F CHANGE TRANSMITTAL 8

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

Encl: (1) Replacement pages III-4-3, III-4-4, VI-5-5, and VI-5-6

1. Purpose. To change responsibility and intervals for fire alarm box inspection, testing, and maintenance. As a result of Regionalization, the Region's Federal Fire Department (N321) is now responsible for inspection, testing, and maintenance of fire alarm boxes. Also, fire alarm systems for dry docks were upgraded and now have supervised alarms. Previously, the alarms were not supervised (e.g. monitored electronically for proper operation). National Fire Protection Association (NFPA) 72 National Fire Alarm Code requires supervised alarm systems to be tested annually. However, because the system is used in an industrial setting and exposed to a marine environment, alarm systems will be tested quarterly.

2. Action

a. Replace pages III-4-3, III-4-4, VI-5-5, and VI-5-6 with enclosure (1).

b. Change pages III-4-3 and VI-5-5 to CH-8 on the List of Effective Pages.

c. Note Change 8 on the Record of Changes page.

d. File this change transmittal in front of the instruction as a record of authority for the change.

/s/
G. R. BRYANT

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NAVSHIPYDPUGETINST P11320.1F CH-7
Code 1124

23 DEC 1997

NAVSHIPYDPUGET INSTRUCTION P11320.1F CHANGE TRANSMITTAL 7

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

1. Purpose. To change subject instruction to reflect new building for sprinkler system test responsibility.

2. Action

a. Make pen change on page III-6-3, paragraph 3d(1)(d): Add Building 983 and Tunnel 4.

b. Make pen change on page III-4-3, Exhibit III-4-1, under Manual Permanent Fire Alarm Box Item, Procedure column: Add Building 983.

c. Make pen change on page III-4-5, Exhibit III-4-1, under Remote Annunciator Item, Procedure column: Add Building 983.

d. Notate Change 7 on the Record-of-Changes page.

e. Update list of Effective Pages to reflect Change 7.

f. File this change transmittal in front of the instruction as a record of authority for the change.

R. T. METZGER
By direction

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NAVSHIPYDPUGET INSTRUCTION P11320.1F CHANGE TRANSMITTAL 6

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

Encl: (1) Revised pages vii, viii, ix, x, xviii, xxii, III-2-2, IV-5-1, IV-5-4, IV-5-6, V-1-15, V-1-17, VI-2-2, VI-5-4, VI-5-5, VI-7-2, VI-7-6, VI-7-7, VI-7-8

1. Purpose

a. To transmit revised pages to the basic instruction.

b. To correct list of effective pages.

c. To provide requirements for vacant buildings.

d. To reflect information on operation and use of current portable fuel tanks.

e. To define restrictions of hot work operations when fire alarm systems are disconnected or impaired.

f. To define notification requirements when fire alarm systems are disconnected.

g. To clarify restriction of poly-tarps in dry docks and near heat sources.

h. To give guidance on fueling of portable gas powered equipment.

i. To remove conflicting statement regarding accountability of shipboard workers.

2. Action

a. Remove pages vii, viii, ix, x, xvii, xviii, xxi, xxii, xxiii, xxiv, xxv, xxvi, III-2-1, III-2-2, IV-5-1, IV-5-2, IV-5-3, IV-5-4, IV-5-5, IV-5-6, IV-5-7, IV-5-8, V-1-15, V-1-16, V-1-17, V-1-18, VI-2-1, VI-2-2, VI-5-3, VI-5-4, VI-5-5, VI-5-6, VI-5-7, VI-5-8, VI-7-1, VI-7-2, VI-7-3, VI-7-4, VI-7-5, VI-7-6, VI-7-7, VI-7-8, VI-7-9, VI-7-10, VI-7-11, VI-7-12, VI-7-13, VI-7-14, and insert enclosure (1).

b. Notate change 6 on the Record-of-Changes page.

c. This change transmittal shall be filed in front of the instruction in the binder as a record of authority for the change.

D. E. BAUGH

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NAVSHIPYDPUGET INSTRUCTION P11320.1F CHANGE TRANSMITTAL 5

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

Encl: (1) Revised pages vii, viii, ix, xix, IV-5-6, IV-5-7, IV-5-8, IV-7-1, VI-3-3

1. Purpose

a. To transmit revised pages to the basic instruction.

b. To reflect correction of list of effective pages.

c. To provide Shipyard and contract personnel requirements for Torch-Applied Roofing operations.

d. To provide Shipyard and contract personnel requirements and areas of restriction for using straw hay bales for erosion and environmental control.

e. To reflect OSHA requirements on maintenance of heat producing equipment.

2. Action

a. Remove pages vii, viii, ix, x, xix, xx, IV-5-5, IV-5-6, IV-7-1, IV-7-2, VI-3-3, VI-3-4, and insert enclosure (1).

b. Notate change 5 on the Record-of-Changes page.

c. This change transmittal shall be filed in front of the instruction in the binder as a record of authority for the change.

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NAVSHIPYDPUGET INSTRUCTION P11320.1F CHANGE TRANSMITTAL 4

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

Encl: (1) Revised pages vii, viii, III-4-2, and III-8-6

1. Purpose

a. To transmit revised pages to the basic instruction.

b. To reflect correction of list of effective pages.

c. To provide responsibility and guidance for testing BEQ and BOQ individual room smoke detectors.

d. To revise weekly/monthly fire pump test conducted by Code 910.

2. Action

a. Remove pages vii, viii, III-4-1, III-4-2, III-8-5, III-8-6, and insert enclosure (1).

b. Notate change 4 on the Record-of-Changes page.

c. This change transmittal shall be filed in front of the instruction in the binder as a record of authority for the change.

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NAVSHIPYDPUGET INSTRUCTION P11320.1F CHANGE TRANSMITTAL 3

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

Encl: (1) Revised pages vii, viii, ix, III-8-1, V-1-5, VI-5-4, VI-5-6

1. Purpose

a. To transmit revised pages to the basic instruction.

b. To reflect correction of list of effective pages.

c. To ensure proper clearances are maintained around fire hydrants.

d. To ensure vehicles are not parked inside of buildings creating a fire hazard.

e. To give direction on removal of fire alarm boxes from service.

f. To clarify locations that metal extinguisher tags can be used.

2. Action

a. Remove pages vii, viii, ix, x, III-8-1, III-8-2, V-1-5, V-1-6, VI-5-3, VI-5-4, VI-5-5, VI-5-6, VI-5-7, VI-5-8, and insert enclosure (1).

b. Notate change 3 on the Record-of-Changes page.

c. This change transmittal shall be filed in front of the instruction in the binder as a record of authority for the change.

D. E. BAUGH

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NAVSHIPYDPUGET INSTRUCTION P11320.1F CHANGE TRANSMITTAL 2

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

Encl: (1) Revised pages vii, viii, ix, xxi, II-2-2, II-2-3, II-3-3, III-4-1, III-4-5, III-4-6, III-4-7, III-4-9, III-6-6, III-6-8, III-8-1, III-8-2, III-8-6, IV-10-1, V-1-1, V-1-9, V-1-16, VI-5-6

1. Purpose

a. To transmit revised pages to the basic instruction.

b. To update testing procedures, frequencies, and to amend the controlling document for Fire Alarm and Fire Suppression equipment. These changes ensure the required performance levels for the protection of life and property at Puget Sound Naval Shipyard.

c. To coincide verbiage to reflect "hazardous material" vs "hazardous substance" in agreement with NAVSHIPYDPUGETINST 5090.5D.

d. To initiate use of metal fire extinguisher inspection tag in areas subject to inclement weather.

2. Action

a. Remove pages vii, viii, ix, x, xxi, xxii, II-2-1, II-2-2, II-2-3, II-2-4, II-3-3, II-3-4, III-4-1, III-4-2, III-4-5, III-4-6, III-4-7, III-4-8, III-6-5, III-6-6, III-6-7, III-6-8, III-6-9, III-6-10, III-8-1, III-8-2, III-8-5, III-8-6, IV-10-1, IV-10-2, V-1-1, V-1-2, V-1-9, V-1-10, V-1-15, V-1-16, VI-5-5, VI-5-6, and insert enclosure (1).

b. Notate change 2 on the Record-of-Changes page.

c. This change transmittal shall be filed in front of the instruction in the binder as a record of authority for the change.

G. R. YOUNT

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NAVSHIPYDPUGET INSTRUCTION P11320.1F CHANGE TRANSMITTAL 1

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

Encl: (1) Revised pages vii, III-4-3

1. Purpose

a. To transmit revised pages to the basic instruction.

b. To increase testing frequency for conducting operational test of temporary master fire alarm boxes for radiological buildings and facilities.

2. Action

a. Remove pages vii, viii, III-4-3, III-4-4, and insert enclosure (1).

b. Notate change 1 on the Record-of-Changes page.

c. This change transmittal shall be filed in front of the instruction in the binder as a record of authority for the change.

J. G. BARBER
By direction

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Code 1124
APR 14 1994

NAVSHIPYDPUGET INSTRUCTION P11320.1F

From: Commander, Puget Sound Naval Shipyard

Subj: FIRE PREVENTION AND PROTECTION MANUAL

Encl: (1) Fire Prevention and Protection Manual

1. Purpose. To reaffirm policy, responsibilities, information, and regulations concerning fire protection and fire prevention for Puget Sound Naval Shipyard.

2. Cancellation. NAVSHIPYDPUGETINST 11320.1E is superseded. The fire prevention and protection requirements for radiologically controlled areas, nuclear ships and submarines are now the subject of NAVSHIPYDPUGETINST P11320.2. Since this is a complete revision, asterisks have not been used to denote changes.

3. Scope. Enclosure (1) applies to all elements of Puget Sound Naval Shipyard, government and contract personnel, all tenant activities, outlying facilities, and all housing areas. In addition, commanding officers of all ships present at Puget Sound Naval Shipyard shall conform with and enforce these regulations as required by U.S. Navy Regulations and Puget Sound Naval Shipyard Regulations.

4. Action. Addressees shall:

a. Ensure compliance with the provisions of this manual. Compliance by all activities, tenants, and contract personnel is mandatory. All situations encountered cannot be covered. To accomplish the Fire Protection/Fire Prevention Program, the essential elements attributed to its success is best demonstrated by an individual's attention on the job and use of common sense.

b. Ensure that manuals are kept current with all change transmittals.

5. Exhibits and Forms. All forms required by this manual may be obtained through Department Forms Managers.

a. Exhibits

(1) I-2-1, Fire Division Organization

(2) II-3-1, Fire Warden Program Organization

(3) II-3-2, Building Fire Warden Fire Inspection Guide

(4) III-4-1, Summary of Fire Alarm and Detection System Inspection, Testing, and Maintenance Requirements and Responsibilities

(5) III-6-1, Summary of Sprinkler System Inspection Testing, and Maintenance Requirements and Responsibilities

(6) III-7-1, Summary of Carbon Dioxide System Inspection, Testing, and Maintenance Requirements and Responsibilities

(7) III-7-2, Summary of Halon System Inspection, Testing, and Maintenance Requirements and Responsibilities

(8) III-7-3, Summary of Dry Chemical Extinguishing System Inspection, Testing, and Maintenance Requirements and Responsibilities

(9) III-8-1, Summary of Fire Hydrant and Fire-Protection Water Main Inspection, Testing, and Maintenance Requirements and Responsibilities

(10) III-8-2, Summary of Dry-Pipe Standpipe Inspection, Testing, and Maintenance Requirements and Responsibilities

(11) III-8-3, Summary of Fire Pump Inspection, Testing, and Maintenance Requirements and Responsibilities

(12) IV-1-1, Sample Building Evacuation Plan

(13) IV-10-1, Fire Lanes District One

(14) IV-10-2, Fire Lanes District Two

(15) IV-10-3, Fire Lanes District Four

(16) V-1-1, Flammable and Combustible Liquid Classification

(17) V-2-1, Marking For Propane Fueled Vehicles

b. Forms

(1) Supplementary Fire Bill, PSNS 11320/18 (Rev. 4-88)

(2) Building Evacuation Plan, PSNS 11320/64 (7-93)

(3) Fire Bill, PSNS SECO OP #1 (4-88)

(4) Daily Fire Alarm System Log, PSNS 11320/65 (7-93)

(5) Outage Request for Contract Work, PSNS 11300/25 (Rev. 4-94)

(6) Fire Extinguisher Inspection Record, NAVFAC 11320/2 (3-75)

(7) Sprinkler system Test Record, PSNS 11320/13 (Rev. 8-93)

(8) Fire Inspection and Action Report, PSNS 11320/35 (Rev. 4-93)

(9) Fire Department NAVOSH Fire Inspection Report, PSNS 11320/47 (Rev. 4-93)

(10) Work Request (Maintenance Management, NAVFAC 9-11014/20 (Rev 2-68)

(11) Emergency/Service Work, PSNS 11320/21 (Rev. 11-83)

(12) Small Appliance Permit, PSNS 11320/20 (9-82)

(13) Hazardous Operation Permit, PSNS 11320/17 (Rev. 11-89)

(14) Hazardous Material Commodity Label, PSNS 5101/25 (Rev. 11-82)

(15) Weekly Inspection and Test of Fire Alarm Boxes, PSNS 11320/57 (10-87)

(16) Gas Free Certificate, PSNS 4730/29 (Rev. 1-91)

G. R. YOUNT

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Enclosure (1)

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PUGET SOUND NAVAL SHIPYARD

FIRE PREVENTION AND PROTECTION MANUAL

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NO.	DATE	DATE CHANGES MADE	CHANGES MADE BY
1	1/18/95	2/2/95	Bill Worley
2	6/9/95	6/20/95	B. Worley
3	10/11/95	10/19/95	
4	1/08/96	1/18/96	
5	4/24/96	4/24/96	B. Worley
6	1/9/97	1/16/97	B. Worley
7	12/23/97	1/3/98	kab
8	2/27/02	2/28/02	kab
9	4/24/03	5/5/03	kab

PSNS 5211/23 (Rev. 05-89)

Enclosure (1)

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LIST OF EFFECTIVE PAGES

PAGE	CHANGE	PAGE	CHANGE	PAGE	CHANGE
1	Original	xxiv	Original	III-1-1	Original
2	Original	xxv	Original	III-1-2	Original
i	Original	xxvi	Original	III-1-3	Original
ii	Original	I-1-1	Original	III-1-4	Original
iii	Original	I-1-2	Original	III-1-5	Original
iv	Original	I-1-3	Original	III-1-6	Original
v	Original	I-1-4	Original	III-2-1	CH-9
vi	Original	I-2-1	Original	III-2-2	CH-9
vii	CH-9	I-2-2	Original	III-2-3	CH-9
viii	CH-9	I-2-3	Original	III-2-4	CH-9
ix	CH-6	I-2-4	Original	III-3-1	Original
x	CH-6	II-1-1	Original	III-3-2	Original
xi	Original	II-1-2	Original	III-3-3	Original
xii	Original	II-1-3	Original	III-3-4	Original
xiii	Original	II-1-4	Original	III-4-1	CH-2
xiv	Original	II-2-1	Original	III-4-2	CH-4
xv	Original	II-2-2	CH-2	III-4-3	CH-8
xvi	Original	II-2-3	CH-2	III-4-4	Original
xvii	Original	II-2-4	Original	III-4-5	CH-2
xviii	CH-6	II-3-1	Original	III-4-6	CH-2
xix	CH-5	II-3-2	Original	III-4-7	CH-2
xx	Original	II-3-3	CH-9	III-4-8	Original
xxi	CH-2	II-3-4	Original	III-4-9	CH-2
xxii	CH-6	II-3-5	Original	III-4-10	Original
xxiii	Original	II-3-6	Original	III-5-1	Original

LIST OF EFFECTIVE PAGES

PAGE	CHANGE	PAGE	CHANGE	PAGE	CHANGE
III-5-2	Original	III-8-1	CH-3	IV-3-6	Original
III-5-3	Original	III-8-2	CH-2	IV-4-1	Original
III-5-4	Original	III-8-3	Original	IV-4-2	Original
III-5-5	CH-9	III-8-4	Original	IV-5-1	CH-6
III-5-6	Original	III-8-5	Original	IV-5-2	Original
III-5-7	Original	III-8-6	CH-4	IV-5-3	Original
III-5-8	Original	III-8-7	Original	IV-5-4	CH-6
III-6-1	Original	III-8-8	Original	IV-5-5	CH-9
III-6-2	Original	IV-1-1	Original	IV-5-6	CH-9
III-6-3	Original	IV-1-2	Original	IV-5-7	CH-9
III-6-4	Original	IV-1-3	Original	IV-5-8	CH-9
III-6-5	Original	IV-1-4	Original	IV-6-1	Original
III-6-6	CH-2	IV-1-5	Original	IV-6-2	Original
III-6-7	Original	IV-1-6	Original	IV-6-3	Original
III-6-8	CH-2	IV-2-1	Original	IV-6-4	Original
III-6-9	Original	IV-2-2	Original	IV-7-1	CH-5
III-6-10	Original	IV-2-3	Original	IV-7-2	Original
III-7-1	Original	IV-2-4	Original	IV-8-1	Original
III-7-2	Original	IV-2-5	Original	IV-8-2	Original
III-7-3	Original	IV-2-6	Original	IV-8-3	Original
III-7-4	Original	IV-3-1	Original	IV-8-4	Original
III-7-5	Original	IV-3-2	Original	IV-8-5	Original
III-7-6	Original	IV-3-3	Original	IV-8-6	Original
III-7-7	Original	IV-3-4	Original	IV-8-7	Original
III-7-8	Original	IV-3-5	Original	IV-8-8	Original

LIST OF EFFECTIVE PAGES

PAGE		PAGE	CHANGE	PAGE	CHANGE
IV-8-9	Original	V-1-10	Original	VI-2-3	Original
IV-8-10	Original	V-1-11	Original	VI-2-4	Original
IV-9-1	Original	V-1-12	Original	VI-3-1	Original
IV-9-2	Original	V-1-13	Original	VI-3-2	Original
IV-9-3	Original	V-1-14	Original	VI-3-3	CH-5
IV-9-4	Original	V-1-15	CH-6	VI-3-4	Original
IV-10-1	CH-2	V-1-16	CH-6	VI-4-1	Original
IV-10-2	Original	V-1-17	CH-6	VI-4-2	Original
IV-10-3	Original	V-1-18	Original	VI-4-3	Original
IV-10-4	Original	V-2-1	Original	VI-4-4	Original
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Volume I - ORGANIZATION AND RESPONSIBILITY

CHAPTER 1 - INTRODUCTION, OBJECTIVE, AND RESPONSIBILITY

Ref: (a) DODINST 6055.6, Department of Defense Fire Protection Program
(b) OPNAVINST 11320.23E, Shore Activities Fire Protection Program
(c) NAVFAC P1021, Navy Shore Establishment Fire Protection/Prevention Program

1. Introduction

a. This instruction issues fire prevention and protection regulations and assigns responsibilities for the Puget Sound Naval Shipyard Fire Prevention and Protection Program.

b. The Shipyard's Fire Protection Division, and all personnel, both civilian and military, are jointly responsible to administer all aspects of the Shipyard's Fire Prevention and Protection Program.

c. Fire protection is defined as the preservation of life and property, and thus mission capability from the perils of fire and hazardous substances through prevention, detection, control, and suppression. These measures encompass engineering, management of resources, inspections, public awareness education, installed fire detection and suppression systems, pre-incident planning, training, and fire fighting.

2. Objective. This instruction prescribes minimum requirements necessary to establish a reasonable level of fire and life safety and property protection from the hazards created by fire and explosion.

3. Fire-Protection Standards. In accordance with reference (a), fire-protection standards consist of the relevant standards promulgated by the Department of Labor (OSHA) and the current National Fire Codes published by the National Fire Protection Association (NFPA). In case of conflicts between OSHA standards and NFPA codes, the more stringent criteria shall apply.

4. Responsibility

a. Commander, Naval Facilities Engineering Command. In accordance with reference (b), shall be responsible for developing and administering the Navy Fire Protection Program ashore, including all aspects and measures related to the prevention, detection, control and extinguishment of fire and hazardous substances.

b. Western Division, Naval Facilities Engineering Command (WESTDIV) is responsible for fire protection engineering and the application of standards and criteria established by Naval Facilities Engineering Command. WESTDIV schedules and conducts fire protection engineering surveys and prepares appropriate reports. Furnishes technical assistance and guidance to the Shipyard Commander on matters pertaining to fire protection engineering when requested.

c. Shipyard Commander is responsible in accordance with references (b) and (c) for:

(1) Administering day-to-day fire-fighting and fire-prevention functions.

(2) Ensuring that fire-fighting forces are directly under the technical supervision of a fire chief qualified for the position by virtue of experience and training.

(3) Organizing and training fire-fighting personnel per directives promulgated by higher authorities.

(4) Conducting an effective Fire Prevention Program, with emphasis on the elimination of fire hazards that are within the capability of local command to correct.

(5) Inspecting and maintaining motorized fire apparatus, portable fire-fighting appliances, fixed and automatic extinguishing equipment, fire alarm/detection and emergency reporting systems, pumping plants, water supply and distribution systems, smoke detectors in housing, and any other fire fighting and fire-protection equipment assigned to the activity.

(6) Reporting to appropriate command including the Commander, Naval Facilities Engineering Command, without delay, all large, unusual, and loss-of-life fires. Request the services of the cognizant area fire marshal and fire protection engineer for technical assistance in investigating and determining the nature, cause, and factors contributing to such fires. Reporting of all fires and related incidents per the Navy fire reporting and data collection system under the cognizance of the Commander, Navy Safety Center.

(7) Reviewing, initiating action, as appropriate, and forwarding fire-fighting inspection reports originated by the cognizant area fire marshal. Reviewing and initiating action on recommendations contained in fire protection engineering survey reports submitted by the cognizant fire protection engineer.

(8) Continuing review of fire-fighting and fire-prevention requirements following current directives and changing conditions, with the view to proper utilization of manpower, materials, and funds.

(9) Providing all fire-fighting personnel with personal protective equipment commensurate with their assigned tasks.

d. Executive Assistant to the Shipyard Commander (Code 1100) is responsible to the Shipyard Commander for overall fire prevention and fire protection of the Shipyard.

e. Director, Security Office (Code 1120) is responsible to Code 1100 for the performance of the Fire Division.

f. Fire Chief, Fire Division (Code 1124). The duties and responsibilities of the Fire Chief are identified in Volume 1 Chapter 2 of this manual.

g. Production Resources Officer (Code 900) is responsible for safety, fire prevention and protection, training, and good housekeeping within the Production Resources Department. Responsible, through the Operations Officer and his assistants, for fire prevention and protection of ships under construction and ships not in commission undergoing repairs, overhauls, conversions, or decommissioning. Responsibility includes establishing for each ship, and commensurate for the hazards involved, an effective fire alarm system, fire-fighting organization and fire bill, training personnel assigned to the fire bill, and providing adequate fire-fighting equipment for shipboard fire fighting.

h. Facilities and Maintenance Officer (Code 910) is responsible for construction, alteration, inspection, testing, maintenance and repair of Shipyard facilities, utility systems, and fire-protection systems and equipment to include:

(1) Fire hydrants, fire mains, and emergency pumping facilities.

(2) Dry chemical, carbon dioxide, sprinkler systems, and halon extinguishing systems in all permanent buildings of the Shipyard.

(3) Shipyard fire alarm system and all fire alarm and fire-detection systems in all permanent buildings of the Shipyard.

i. Department/Office Heads

(1) Are responsible for compliance with this manual and enforce fire regulations, as defined in this manual, and carry out recommendations and guidelines as may be issued by the Shipyard Fire Division.

(2) Assure that personnel are properly instructed in fire-safety practices and all applicable provisions of this manual.

(3) Appoint a Department Fire Warden in order to perform the duties identified in Volume 2, Chapter 3 of this manual.

(4) Notify the Fire Prevention Branch (Code 1124.2) in writing of personnel assigned as fire wardens in each building and area under their cognizance.

j. Tenant Activities shall comply with the fire-prevention regulations of this manual. Tenant activities' responsibilities are identified in paragraph 4i(1) through (4) above. The area of fire protection and fire prevention provided extends to all tenant activities residing within the Shipyard as well as in outlying areas, assigned or attached to the Shipyard.

k. Commanding Officers of Commissioned Ships are assigned responsibility for fire prevention and protection of ships in commission. The Shipyard shall provide fire-fighting assistance upon request of the ship's commanding officer.

l. Commanding Officers of Commissioned Ships Undergoing Overhaul or Repair shall comply with the fire-prevention regulations of this manual. Fire-protection services will be provided in accordance with the established Memorandum of Agreement (MOA) between the Shipyard, the ship, and this manual.

m. Contractors. All contractors performing work at Puget Sound Naval Shipyard shall comply with the fire-prevention regulations of this manual and other guidelines as may be issued by the Shipyard Fire Division.

Volume I - ORGANIZATION AND RESPONSIBILITIES

CHAPTER 2 - FIRE DIVISION ORGANIZATION AND RESPONSIBILITY

1. Purpose. This chapter identifies the organization, essential responsibilities, and authority of the Fire Division in the Shipyard Fire Prevention and Protection Program.

2. Policy

a. Fire Division (Code 1124) Organization and Responsibility. The Fire Division organization shall be in accordance with Exhibit I-2-1. The essential responsibility and authority of the Fire Division shall include:

(1) Fire Chief (Code 1124) is responsible for the management and operational control of the Fire Division. These responsibilities include:

(a) During an emergency the Fire Chief, or the Senior Fire Officer On-Scene, shall implement and maintain the Incident Command System and shall maintain responsibility for emergency operations.

(b) The preparation of fire regulations and supervision of their enforcement, subject to approval by the Shipyard Commander.

(c) Management of an ongoing Fire Prevention Program with responsibility for inspection of buildings, facilities, and fire-protection systems and equipment, training of Shipyard personnel, investigation and reporting of all fires, and the granting of permits for hazardous operations.

(d) The procurement of necessary fire equipment.

(e) Approval through collaboration with the Facilities and Maintenance Officer (Code 910), and other cognizant organizations, of all plans (pertaining to fire-protection and life-safety requirements) for the construction, modification, alteration of buildings, both permanent and temporary, water systems, fire alarm systems, heat and smoke detection systems, sprinkler systems and other fire-protection equipment.

(f) The establishment and maintenance of reciprocal mutual aid agreements with surrounding city fire departments and fire districts.

(g) The implementation and administration of training of Fire Division personnel to maintain proficiency throughout all functional areas of Fire Division operations and to meet established requirements.

(2) Fire Suppression Branch (Code 1124.1)

(a) The Senior Fire Officer On-Scene conducting operations in connection with the extinguishment and control of any fire, explosion, or other emergency shall have the authority to direct all operations of fire extinguishment or control and to take all necessary precautions to save life, protect property, and prevent any further injury or damage. During such operations, including the investigation of the cause of such emergency, the Senior Fire Officer On-Scene may control or prohibit the approach to the scene of such emergency by any vehicle, vessel, or person.

(b) The Senior Fire Officer On-Scene in charge of an emergency shall have the authority to establish barriers to control access to the vicinity of emergencies. No persons, except as authorized by the Senior Fire Officer On-Scene, may cross such barriers.

(c) The Senior Fire Officer On-Scene has the authority to order the immediate evacuation of any occupied building, facility, ship, or area, deemed unsafe when such building, facility, ship, or area has hazardous conditions that presents an imminent danger to life.

(d) Shall conduct inspection and tests in accordance with this manual.

(3) Fire Prevention Branch (Code 1124.2)

(a) Is authorized to inspect any building, facility, ship, area, or process for dangerous or hazardous conditions or materials for compliance of all applicable fire and life-safety regulations.

(b) Is authorized to require records to be provided to verify testing and maintenance of fire protection and detection systems.

(c) Is authorized to inspect and issue hazardous operation permits, require notices and signs to be posted pertaining to fire control and fire hazards.

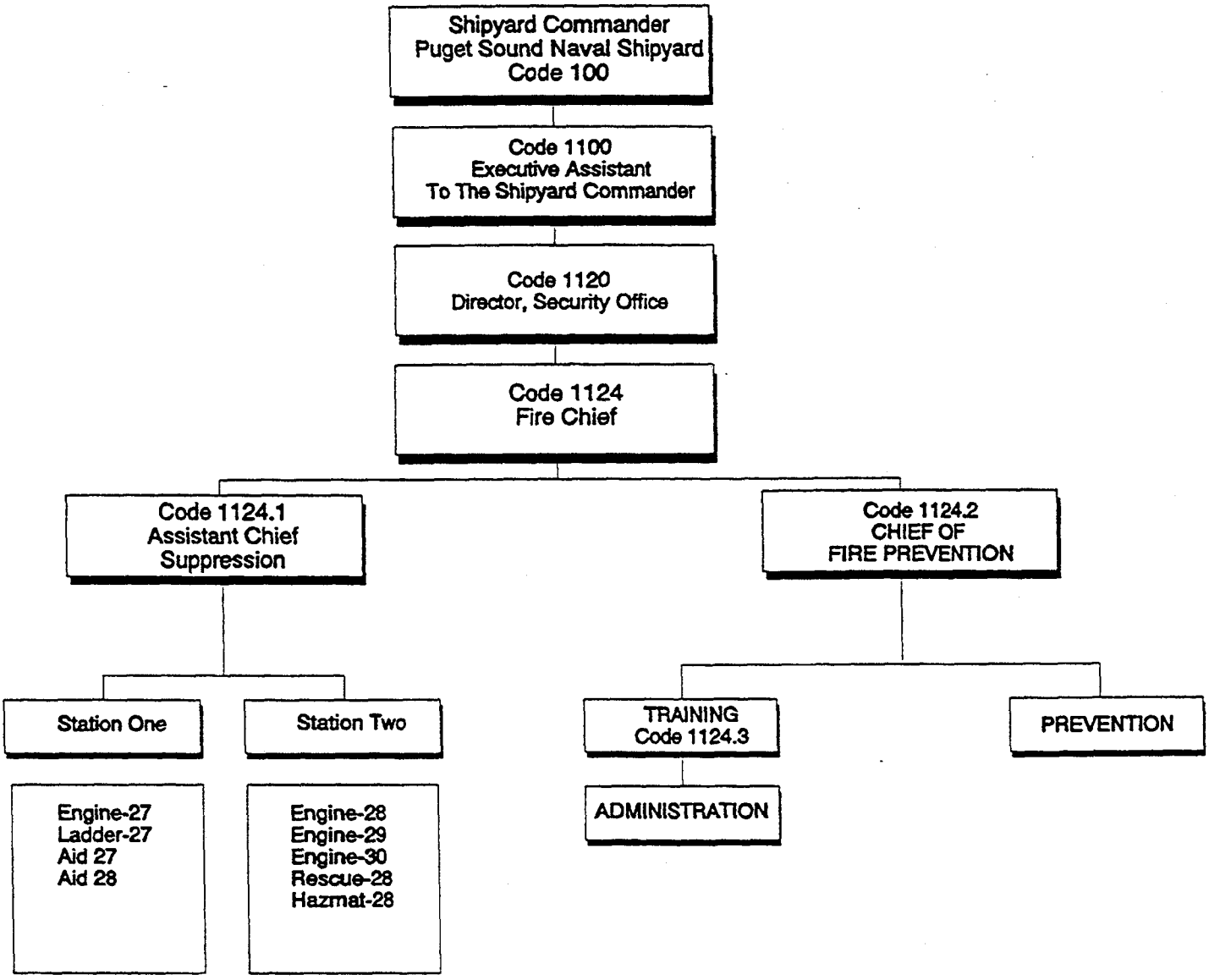

Exhibit I-2-1
Fire Division Organization

Enclosure (1)

(4) Is authorized to order any person(s) to remove or remedy such dangerous or hazardous condition or material. Any person failing to comply shall be in violation of this manual.

(5) Shall have the authority, where conditions exist, which are deemed immediately hazardous to life and property, to summarily abate such hazardous condition.

(6) Shall have the authority to investigate the cause, origin, and circumstances of any fire, explosion, or other hazardous condition. This authority shall include the authority to investigate incidents aboard active ships in overhaul. This authority shall include the taking into custody of all physical evidence relating to the cause of the fire, explosion, or other hazardous condition.

(7) Shall have the authority to review plans and specifications to ensure compliance with applicable fire and life-safety regulations.

(8) Shall have the authority to develop and implement public Fire Safety Education Programs, as deemed necessary, for the general welfare with respect to the potential fire hazards within the Shipyard and in private life.

(9) Shall provide training in the use of portable fire extinguishers when requested from Department Fire Wardens. Training shall be arranged by calling the Fire Prevention Branch at 63124.

(10) Shall conduct training of all assigned Department and Building Fire Wardens.

(11) Shall provide other fire safety classes upon request from Department Fire Wardens.

(12) Shall conduct annual evacuation drills of all major buildings.

(13) Shall conduct annual inspections of East Park and Shipyard Officers' Housing units.

b. Fire Division Training Branch (Code 1124.3) shall develop and provide training of Fire Division personnel to maintain proficiency throughout all functional areas of Fire Division operations and to meet established requirements.

VOLUME II - GENERAL FIRE PROTECTION AND PREVENTION ASSIGNMENTS

CHAPTER 1 - PROCEDURES FOR REPORTING FIRES

1. Purpose. This chapter provides the requirements and procedures for reporting fires and for the evacuation of personnel in emergencies. Additional information for reporting emergencies and evacuation of ships is provided in Volume VI, Chapter 2 of this manual.

2. Policy

a. Naval Emergency Services Communications (NESCOM) is the Shipyard's centralized emergency services dispatch center. Fire alarms connected to the Shipyard Alarm System terminate at NESCOM. All shipyard emergencies can be reported by dialing 911. Some telephone systems, for example 478 prefixes, are not connected to NESCOM. Personnel in these areas shall be familar with the dialing procedures to report emergencies to NESCOM.

b. Upon Discovery of a Fire. Regardless of its size, location, or probable consequence, personnel are required to immediately operate the nearest fire alarm box (if available) or dial 911.

(1) The early discovery of fire is important to limiting injuries, loss of life, and property. However, the responsibility of personnel to report a fire immediately will not be accomplished at the risk of personal injury. Report the emergency from a safe location outside the building or area, if necessary.

(2) The Fire Division will be notified immediately of all fires that occur, even those that have been extinguished.

(a) Ensure a fire alarm is given.

(b) Assist in evacuating building or area.

(c) Perform assigned functions which do not endanger personal safety identified on the Supplementary Fire Bill, PSNS 11320/18 (Rev. 4-88).

(d) Ensure Fire Division has been notified.

(e) Use portable fire extinguishers to extinguish or contain the fire if it is discovered in an early stage and does not endanger personnel.

(f) Have someone meet Fire Division personnel and direct them to the fire.

(g) Report to the Fire Division any personnel reported missing and when the building has been evacuated.

c. Reporting Fires by Telephone

(1) Dial 911. Report as clearly as possible the nature of the emergency, the name and number of the building, floor, geographic location, area, street, pier, ship, dry dock, or other means of location identification.

(2) After receiving the initial information NESCOM may put you on hold to dispatch emergency equipment. Do not hang up until the dispatcher acknowledges receipt of all pertinent information.

(3) After completing the call proceed to a location to direct arriving emergency response personnel to the location of the fire.

d. Reporting Fires By Fire Alarm Box

(1) Numerous fire alarm and fire-detection systems in the Shipyard are interconnected and terminate at NESCOM. Personnel should be aware of the fire alarm, fire detection, and fixed fire-protection systems in the buildings in which they work. Whenever possible, follow up reporting fires by fire alarm box, by dialing 911 to assure emergency response personnel have been notified. These systems are described briefly below:

(a) Master Fire Alarm Boxes are located throughout the Shipyard and are divided into seven districts for purpose of identification. All master fire alarm boxes terminate at NESCOM.

(b) Auxiliary Fire Alarm Boxes are located in major buildings and other areas. These fire alarm boxes are connected to master fire alarm boxes and generally provide a means to sound a local evacuation alarm within the building or area as well as send the alarm to NESCOM.

(c) Fire Detection and Fixed Fire-Protection Systems are installed in many buildings and are generally activated automatically by the presence of smoke or heat. These systems generally sound a local evacuation alarm, notify NESCOM, and may discharge an extinguishing agent such as water, dry powder, halon, or carbon dioxide.

(d) Temporary Fire Alarm Systems are installed aboard ships, submarines, and structures involved in the overhaul process. These systems provide a manual means of alarm activation and local evacuation.

(2) To report a fire from a master fire alarm box pull the exterior door down to expose the inner lever. Pull the interior lever down all the way and release. If possible, remain at the master fire alarm box to direct arriving emergency response personnel to the location of the fire.

(3) To report a fire from an auxiliary fire alarm box pull exposed alarm lever down and release. Evacuate the area. Proceed to a location to direct arriving emergency response personnel to the location of the fire.

(4) Malicious Activation of Fire Alarms. The malicious activation or tampering with fire alarms or fire alarm systems is a violation of this manual.

e. Evacuation Procedures

(1) On activation of an evacuation alarm, or order to do so, personnel will evacuate in an orderly manner.

(a) Personnel shall be familiar with the building or area in which they work and be able to identify alternate means of escape.

(b) In the event of a fire or other emergency in which the evacuation of the building is required, elevators are programmed to return to the ground floor to be available for fire fighter's use. Elevators will not normally be available, nor are they considered a safe means to evacuate multistoried buildings during a fire or other emergency. The means of escape shall be by stairway. Occupants of buildings equipped with elevators will use stairways to exit the building.

(2) Personnel with specific assignments as identified on the Supplementary Fire Bill, PSNS 11320/18 (Rev. 4-88), will accomplish these tasks, except if such assignments place personal safety at risk.

(3) All personnel will muster with their supervisor at the designated assembly area.

(a) Supervisors will account for all personnel and report to the Building Fire Warden(s) any personnel that are missing.

(b) Supervisors will assure that once their personnel have evacuated reentry is prohibited until permitted by the Fire Division.

(4) The Building Fire Warden(s) will report to the Senior Fire Officer any personnel who are reported missing, and when the evacuation has been completed.

f. Evacuation of Physically Impaired Employees

(1) Every physically impaired person, those requiring special assistance during evacuation of their building, shall be provided with a safe means of escape from the building.

(2) In accordance with Volume II, Chapter 3, para. 3b(5), Department Fire Wardens shall notify the Fire Division of the location and means by which permanently physically impaired personnel shall be evacuated.

(a) Personnel assigned to assist permanently physically impaired personnel, and their alternates, shall be identified on the Supplementary Fire Bill, PSNS 11320/18 (Rev. 4-88).

(b) Personnel who are temporarily physically impaired do not need to be reported. However, the worker's limitation shall be considered when assigning work, and assistance assigned, to assure they are provided with a safe means of escape.

(c) The evacuation procedure of permanently physically impaired personnel shall be evaluated annually during building fire drills.

CHAPTER 2 - RESPONSE TO EMERGENCIES

Ref: (a) NAVSHIPYDPUGETINST 11320.7F, Reciprocal Fire Protection Agreements
(b) NAVSHIPYDPUGETINST 6300.1C, Shipyard Emergency Medical Response Procedures
(c) NAVSHIPYDPUGETINST P5090.1D, Oil and Hazardous Substance (OHS) Spill Contingency Manual
(d) NESCOM Standard Operating Procedures
(e) Current Fire Fighting Mutual Aid Agreements

1. Introduction. This chapter identifies standard response procedures of the Fire Division to emergencies and details additional assignments and responsibilities of other emergency and nonemergency organizations. Additional response procedures and responsibilities for fires aboard ship are detailed in Volume VI, Chapter 2 of this manual.

2. Reciprocal Mutual Aid Response. Requests to assist and to request assistance from outside organizations shall be in accordance with reference (a).

3. Response to Medical Emergencies shall be in accordance with reference (b).

4. Response to Oil and Hazardous Substance Emergencies shall be in accordance with reference (c).

5. Response to Fire Emergencies

a. Responsibilities

(1) Shop 03 shall respond to all alarms to which they are dispatched by NESCOM to provide electrical and maintenance support, and other support services as directed by the Senior Fire Officer On-Scene. After normal duty hours, Shop 03 supervision will be responsible for follow-up and repair of essential services and shall seek or possess authority to approve overtime for such repairs.

(2) Shop 72 shall respond to all alarms to which they are dispatched by NESCOM to provide rigging support, manpower assistance, crane direction, and other support services as directed by the Senior Fire Officer On-Scene.

(3) Shop 99 shall respond to all alarms to which they are dispatched by NESCOM to provide support services for temporary power, ventilation, temporary fire alarm systems, and other temporary services as directed by the Senior Fire Officer On-Scene.

(4) Code 105 shall respond to all emergencies involving radiologically controlled areas or radioactive material and shall provide radiological support to the Senior Fire Officer On-Scene.

(5) Code 106

(a) Shall respond in accordance with reference (c), and to all emergencies which involve or potentially involve hazardous * substance. Code 106.3 shall provide environmental technical assistance and support to the Senior Fire Officer On-Scene.

* (b) Shall respond to all emergencies to which they are dispatched. Code 106.2 shall provide gas-free support, hazardous substance response support, investigate mishaps, and provide safety and health technical assistance and support to the Senior Fire Officer On-Scene.

(6) Shipyard Watch Office (Code 340.2) shall be notified by NESCOM of all emergencies. The Shipyard Watch Office shall notify the Shipyard Command Duty Officer. When military support functions, such as the tug boats are needed, the Watch Office shall dispatch and coordinate these functions.

(7) Shipyard Security Police (Code 1121.1) shall respond to all emergencies and provide traffic control and other security-related support services as requested by the Senior Fire Officer On-Scene.

(8) Naval Emergency Services Communications (NESCOM) (Code 1121.14) shall dispatch Fire Division apparatus and personnel and other support organizations in accordance with references (a) through (d).

(a) Initiate a call back of off-duty Fire Division personnel as directed by the Senior Fire Officer on-scene in accordance with reference (d).

(b) Initiate a request for mutual aid as directed by the Senior Fire Officer On-Scene in accordance with referenceS (a), (d), and (e).

(c) Notify the Shipyard Watch Office (Code 340.2) of all emergencies.

(d) Provide communication support services in accordance with references (a) through (d).

(9) Senior Fire Officer On-Scene (Code 1124) shall have the responsibility and authority to direct such operations as may be necessary to extinguish or control any fire, perform any rescue operation, investigate the existence of suspected or reported * fires, gas leaks, hazardous substance incidents, or other hazardous conditions. They shall receive the support and have the authority to direct all organizations involved or summoned to the emergency.

(a) In the exercise of such responsibility, the Senior Fire Officer may prohibit any person, vehicle, vessel, or thing from approaching the scene and may remove or cause to be removed, or kept away from the scene any vehicle, vessel, or thing which may impede or interfere with the operations of the Fire Division.

(b) Any person who obstructs the operations of the Fire Division in connection with extinguishing any fire, or other emergency, or disobeys any lawful command of the Senior Fire Officer, or any police officer assisting the Fire Division, shall be in violation of this manual.

(c) On arrival at the scene of all emergencies, the Senior Fire Officer On-Scene shall establish Incident Command at a stationary command post and notify NESCOM of the location.

(d) All arriving personnel and support functions shall report to the Incident Command Post.

b. Response of Emergency Vehicles to Emergencies

(1) Emergency vehicles responding to an emergency shall make use of emergency visual and audible signals. Operators of emergency vehicles shall drive with due regard for the safety of personnel.

(2) Upon the approach of an emergency vehicle making use of audible and visual signals, all vehicles and personnel shall yield the right of way. Vehicles shall immediately drive to a position parallel to, and as close as possible to, the right-hand edge or curb of the road clear of any intersection and shall stop and remain in such position until the emergency vehicle(s) has passed, except when otherwise directed by a police officer or fire fighter.

(3) No vehicle shall be driven over any unprotected fire hose when laid down to be used at a fire scene without the permission of the Senior Fire Officer On-Scene.

(4) Emergency vehicles responding to an emergency shall not be followed by other vehicles closer than five hundred feet or stop such vehicle within five hundred feet of emergency vehicles stopped in answer to a fire alarm.

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Volume II - GENERAL FIRE PREVENTION AND PROTECTION ASSIGNMENTS

CHAPTER 3 - FIRE WARDEN PROGRAM

1. Introduction. All Shipyard personnel and tenants have a responsibility for the physical condition, cleanliness, and fire safety of the buildings and facilities in which they work. Many buildings and facilities of the Shipyard are old and require constant attention and monitoring. To ensure a safe work environment, early detection and correction of deficiencies are extremely important.

2. Purpose. This chapter establishes a program of responsibility for Department and Building Fire Wardens. The Building Fire Warden Program is promulgated to assist Department/Office Heads in discharging their responsibility for fire prevention in buildings, facilities, and areas under their cognizance.

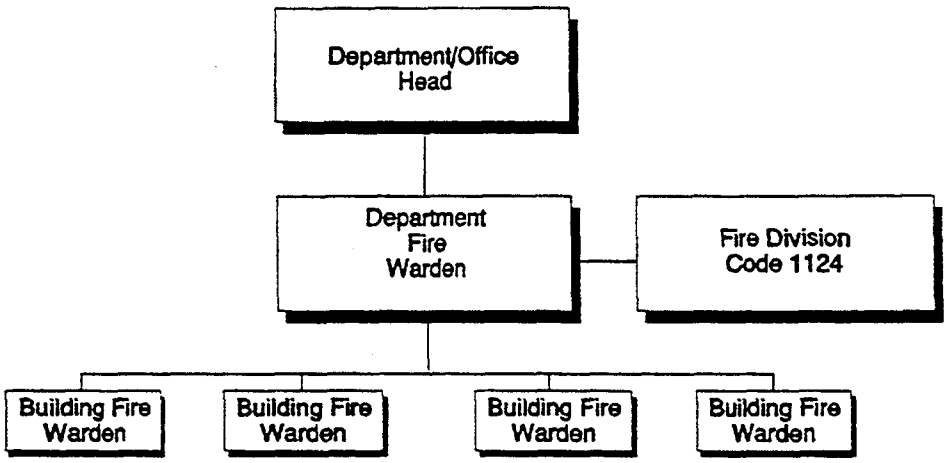

Exhibit II-3-1 Fire Warden Program Organization

3. Responsibilities

a. Department/Office Heads are responsible for fire prevention in buildings, facilities, and areas under their cognizance and shall:

(1) Appoint a Department Fire Warden.

Enclosure (1)

(2) Notify the Fire Prevention Branch (Code 1124.2) in writing of person assigned as Department Fire Warden, and make changes to these assignments, as required.

b. Department Fire Warden is a civilian or military person designated by their Department/Office Head to be responsible for discharging fire-prevention responsibility in all buildings, facilities, and areas assigned to the Department/Office. For purpose of program continuity, persons assigned to this position should retain the position for a period of at least one year. The Department Fire Warden shall:

(1) Be the designated point of contact between the Fire Division and the Department/Office on all matters relevant to fire and life safety.

(2) Assign a minimum of one Building Fire Warden for each building and area under the cognizance of their Department/Office. Provide in writing to the Fire Division the names and areas of responsibility of each Building Fire Warden, and make changes to these assignments, as required.

(3) Ensure Employee Emergency Action Plans are posted and maintained in accordance with Volume IV, Chapter 1, paragraphs 2d and 2e of this manual. The forms are as follows:

(a) Building Evacuation Plan, PSNS 11320/64 (7-93)

(b) Supplementary Fire Bill, PSNS 11320/18 (4-88)

(c) Fire Bill, PSNS SECO OP #1 (4-88)

(4) Notify the Fire Division in writing of the location of all permanently physically impaired personnel who require special assistance to evacuate and the method to be used to evacuate these personnel in a fire or other emergency.

(5) Ensure fire hazards and deficiencies are corrected in a prompt manner. Initiate work requests and emergency and routine service calls for correction of deficiencies. Report any unsafe fire condition which is beyond their immediate control to correct to the Fire Division.

(6) Ensure Department level policy exists to provide for closure inspection of facilities prior to securing facilities.

(7) Ensure assigned Building Fire Wardens are performing assigned tasks in accordance with paragraph c below.

* c. Building Fire Warden is a civilian or military person designated by their Department Fire Warden to discharge the responsibilities identified below in the building, facility or area assigned. For purpose of program continuity, persons assigned to this position should retain the position for a period of at least one year. The Building Fire Warden shall:

* (1) Post and keep current Employee Emergency Action Plans. Consult with Fire Prevention Inspector at 6 3124 for assistance.

(a) Fire Bill, PSNS SECO OP #1 (4-88)

(b) Supplementary Fire Bill, PSNS 11320/18 (Rev. 4-88)

(c) Building Evacuation Plans, PSNS 11320/64 (7-93)

(2) At a minimum conduct an annual review of Employee Emergency Action Plans for accuracy.

(3) Inspect all portable fire extinguishers in areas assigned monthly in accordance with Volume III, Chapter 5, paragraphs 6b and 6c of this manual.

(4) Conduct periodic inspections of all assigned areas to identify hazards. The inspections are conducted to ensure all fire or life-safety hazards are identified and corrected in assigned buildings, areas, or facilities. Use exhibit II-3-2 as a guide when conducting inspections.

(5) Take prompt corrective actions of correctable deficiencies. Unsafe potential fire hazards beyond their immediate control to correct will be reported to the Department Fire Warden.

(6) Accompany assigned Fire Prevention Inspector on periodic inspections of building or area assigned.

(7) Participate and evaluate annual evacuation drills of buildings or areas assigned.

d. Fire Division (Code 1124) shall:

(1) Administer the Building Fire Warden Program.

(2) Provide training and guidance to personnel assigned Department Fire Warden and Building Fire Warden duties in order that they can fulfill the duties and responsibilities of the position.

(3) Perform fire-prevention inspections and bring any deficiencies to the attention of the Department Fire Warden.

(4) Review and approve all building fire evacuation plans prior to posting.

(5) Schedule buildings for annual fire drill.

EXHIBIT II-3-2
BUILDING FIRE WARDEN
FIRE INSPECTION GUIDE

ITEM	SAT	UNSAT	CORRECTIVE ACTION
1. **Electrical Safety**			
a. Are all electrical panels accessible and not blocked by filing cabinets, doors, equipment, etc?			
b. Are all outlets in good repair, free of cracks, and mounted correctly?			
c. Are electrical panels properly labeled with services they provide?			
d. Are electrical cords in good repair, not frayed, split, or lacking strain relief?			
2. **Fire Safety**			
a. Are all exit ways clear?			
b. Are all exits marked and properly illuminated?			
c. Are all emergency lights operative?			
d. Is area around fire alarms and extinguishers clear?			
e. Are all fire extinguisher locations identified?			
f. Are all fire extinguishers properly mounted and accessible?			
g. Are flammable and combustible liquids stored in proper flammable liquid storage cabinets as required by this manual?			

ITEM	SAT	UNSAT	CORRECTIVE ACTION
h. Are MSDS's available on hazardous materials and kept where they are readily available to employees and emergency response personnel?			
i. Are supplies stacked closer than 18 inches below any sprinkler head.			
j. Is the Fire Evacuation Plan posted?			
k. Are Coffee mess facilities posted with a permit?			
l. Are compressed gas cylinders secured, with caps in place, in the upright position to prevent damage?			
m. Are all hazardous materials labeled?			
n. Are "NO SMOKING" signs posted in areas where required?			
o. Are doors in stairways and fire doors which are required to be kept closed maintained closed?			

VOLUME III - FIRE-PROTECTION SYSTEMS AND EQUIPMENT; OPERATION, INSPECTION, TESTING, MAINTENANCE REQUIREMENTS, AND RESPONSIBILITY

CHAPTER 1 INTRODUCTION AND RESPONSIBILITY

Ref: (a) OPNAV Instruction 11320.23E, Shore Activities Fire Protection Program
(b) NAVFAC P-1021, Navy Shore Establishment Fire Protection/Prevention Program
(c) NAVFAC MO-117 Maintenance of Fire Protection Systems

1. Purpose

a. References (a) and (b) establish the responsibility for commanding officers in charge of shore activities to establish an Inspection, Test, and Maintenance Program for installed fire-protection systems and for fire-fighting water systems, including hydrants. Reference (b) requires fire-protection systems to be tested in accordance with reference (c).

b. To establish a Fire Protection System Maintenance Program which identifies operation, inspection, testing, and maintenance requirements and responsibilities delineated in references (a) through (c) for fire protection and detection systems and equipment in the Shipyard.

2. Introduction. Adequate maintenance of fire alarms and fire-protection systems is as critical as the original decision to install them. Because fire suppression, detection, and alarm systems are not used on a routine basis, their state of readiness is not obvious. However, when these systems are called to work, there is an emergency at hand, and they must work properly the first time.

3. Objective. The maintenance program consists of inspection, testing and maintenance at the frequency required by reference (c) and this manual. The objectives of the Fire Protection Maintenance Program are:

a. Prevention or prompt detection of deficiencies or damage.

b. Prompt maintenance or repairs in an economical and workable manner.

c. Avoidance of unnecessary interruptions and danger to personnel, facilities, and mission of the Shipyard.

d. Because of the large number of manufacturers and models for a given fire-protection system, this volume cannot be considered to be applicable in every detail to a particular device or system. Rather, the principles apply on a generic basis for any given device or system.

e. Technical support for inspection, testing, maintenance, and operation of fire-protection systems is available through Naval Facilities Engineering Command Headquarters, or Engineering Field Activity (EFA) Silverdale.

4. Definitions

a. Automatic Detection System is any system the function of which is to detect the presence of heat, smoke, or flame, and sounds an alarm locally and notifies the Fire Division by way of a fire alarm box. Principally, fire-detection systems are either heat, smoke, or flame detection systems, or a combination of both. They may or may not activate other fixed fire-protection systems in the building.

b. Auxiliary Fire Alarm Boxes are used in larger buildings, ships, and other facilities to provide a manual means of sounding a local evacuation alarm and notifying the Fire Division.

c. Fixed Fire-Protection Systems

(1) Automatic Sprinkler Systems are devices for automatically distributing water upon activation by heat. The sprinkler system distributes enough water to either extinguish it entirely or prevent its spread until the arrival of the Fire Division. Properly installed and maintained, they are the most effective of any of the various safeguards against loss of life and property. There are four different types of systems installed in the Shipyard:

(a) Wet-Pipe Sprinkler System employ automatic sprinklers attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers opened from heat from a fire.

(b) Dry-Pipe Sprinkler System employ automatic sprinklers attached to a piping system containing air under pressure, the release of which (as from the opening of a sprinkler) permits the water pressure to open a valve known as the dry-pipe valve. The water then flows into the piping system and out the opened sprinklers.

(c) Deluge Sprinkler System employ open sprinklers attached to a piping system and connected to a water supply through

a valve that is opened by manual operation. When this valve opens, water flows into the piping system and discharges from all sprinklers.

(d) Pre-action Sprinkler System employ automatic sprinklers attached to a piping system containing air that may be under pressure, with a supplemental detection system installed in the same area as the sprinklers. Actuation by the detection system opens a valve that permits water to flow into the sprinkler piping system and to be discharged from any sprinkler that may be open.

(2) Carbon Dioxide Extinguishing Systems are systems installed to protect electrical equipment, high-value data processing equipment, or provide fire-fighting capabilities in buildings where carbon dioxide is the preferred extinguishing agent.

(3) Class I Dry-Pipe Standpipe Systems are standpipes in which there is no permanent water supply. Water must be supplied by the Fire Division. It provides 2½-inch hose connections designed for use by the Fire Division.

(4) Dry Chemical Extinguishing Systems are fixed systems primarily utilized for protecting flammable liquid storage and commercial cooking equipment.

(5) Halon Extinguishing Systems are systems usually installed for the protection of computer and other high-value electronic equipment. Halon extinguishing agents include Halon 1211 and Halon 1301.

d. Inspection. A visual examination of a fire-protection system or portion thereof, to verify that it appears to be in operating condition and is free of physical damage.

e. Maintenance. Work performed to keep equipment operable or to make repairs.

f. Master Fire Alarm Box is a fire alarm box that can be activated manually or is activated by fire detection, auxiliary alarm, or fixed fire-protection systems connected to it.

g. Portable Fire Extinguishers are first aid appliances intended to be used by personnel on scene for the extinguishment of small fires. Typical fire extinguishers used in the Shipyard include: pressurized water, carbon dioxide, halon, and dry chemical fire extinguishers.

h. P.S.I, also psi, is the abbreviation for pounds per square inch.

i. Testing. A procedure to determine the status of a fire-protection system as intended by conducting periodic physical checks on fire-protection systems, such as water flow tests, fire pump tests, alarm tests, etc.

5. Policy

a. Acceptance Testing of Fire-Protection Systems. In accordance with reference (b), a qualified fire-protection engineer shall conduct inspections and tests of fire-protection equipment installations prior to acceptance by the officers in charge of construction.

b. Malfunctions of Fire-Alarm Systems. Fire-alarm systems which repeatedly malfunction shall be disconnected from the Shipyard fire-alarm system and remain disconnected until adequate corrective action has been taken to correct the problem. It shall be the responsibility of the cognizant organization to assure repairs are initiated immediately and that the system is re-connected to the Shipyard fire-alarm system to minimize the impairment to the system.

c. Inspection, Testing, and Maintenance Responsibility. The cognizant Shops and Codes identified shall maintain all systems and equipment in an operable condition at all times. Inspection, testing, and maintenance requirements shall be performed, as assigned by this manual. The inspection, testing, maintenance, and repair of fire-protection systems and equipment shall be performed by personnel specifically qualified and trained for the task. Inspection, testing, and maintenance records shall be forwarded to Code 1124.

(1) Facilities and Maintenance Officer (Code 910)

(a) Is responsible for inspection, testing, and maintenance of Shipyard fire-protection systems and equipment in accordance with reference (c) and this manual. Systems shall include:

1. Fire hydrants, fire mains, and fire pumps.

2. Portable fire extinguishers, dry chemical, carbon dioxide, sprinkler systems, standpipe systems, halon extinguishing systems.

3. Shipyard fire alarm system and all fire alarm and fire-detection systems in all permanent buildings of the Shipyard.

4. Inspection testing and maintenance of all fire alarm, detection, and protection systems in Buildings 839 and 880.

(b) Copies of inspection, testing, and maintenance records and reports shall be forwarded to the Fire Division.

(2) Production Resources Officer (Code 900)

(a) Is responsible for inspection, testing, and maintenance of Shipyard fire protection systems and equipment to include:

1. Temporary fire alarm systems and hose stations placed aboard ships undergoing an industrial availability in the Shipyard.

2. Fire alarm, fire-protection, and fire-detection systems placed in temporary buildings and structures to include DST and SHT Enclosures, Nuclear Refueling Complexes, and other temporary facilities, ships and barges that support Production.

3. Portable fire extinguishers issued for use aboard noncommissioned ships, barges not assigned to Ship's Force or the Barge Office, hot-work processes, temporary shacks, piers and dry docks.

(b) Copies of inspection, testing, and maintenance records and reports shall be forwarded to the Fire Division.

(3) Fire Division (Code 1124)

(a) Maintain managerial responsibility of the fire alarm and fire-protection systems and equipment in the Shipyard. Deficient conditions, including failure to perform required inspection, testing, or maintenance, shall be reported to the cognizant organization for immediate corrective action.

(b) In accordance with Volume I, Chapter 2 of this manual, is authorized to conduct periodic audits of inspection, testing, maintenance procedures, and record keeping.

(c) Conduct inspections and tests as assigned by this manual.

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VOLUME III - FIRE-PROTECTION SYSTEMS AND EQUIPMENT; OPERATION, INSPECTION, TESTING, MAINTENANCE REQUIREMENTS, AND RESPONSIBILITY

CHAPTER 2 FIRE ALARM AND FIRE PROTECTION SYSTEM OUTAGES

1. Purpose. This chapter establishes procedures and responsiilities for personnel requesting fire alarm and fire protection system outages. This chapter also establishes procedures and responsibilities of cognizant shops and codes to assure that fire alarm and fire protection systems are in-service at all times.

2. Introduction. Fire alarm and fire protection system outages shall be closely monitored to assure that the fire alarm and protection systems are restored promptly and that the extent of the outage is minimized.

3. Policy

a. General

(1) Necessary work on fire alarm and fire protection systems shall be conducted on an emergency basis in order to limit impairment of fire protection to the absolute minimum period of time. Where it is essential that fire alarm or fire protection systems be impaired for longer periods of time, measures shall be effected to maintain the maximum possible degree of fire protection
* during the entire period of the outage. Outages affecting fire alarm or fire protection systems will be submitted to the Fire Chief on form PSNS 11320/69 (5-98) Fire Protection/Alarm System Outage Request/Authorization. No outage will take place until this form has been signed by the Fire Chief or his designated representative.

(2) Shipyard fire alarm and fire protection systems shall not be moved, disconnected, or removed by any other trade or shop except Facilities and Maintenance Fire Alarm Technicians. When Facility and Maintenance personnel are unavailable to take fire alarm and fire protection systems off-line, Code 1124 personnel shall provide the services requested.

(3) Prior to the commencement of any work on fire alarm or fire protection systems, the Fire Division and Facilities and Maintenance shall be notified. Facilities and Maintenance shall be responsible for securing and reactivating the system. No other personnel are authorized to disable Shipyard fire alarm or fire protection systems.

(4) All personnel shall notify Fire Department of all
* work that may affect any fire alarm or fire protection system, (i.e., smoke detectors, sprinkler systems, and auxiliary pull

stations). Work that requires reporting includes, but is not limited to, hot work next to sprinkler heads or any operation that creates dust in areas where smoke detectors are present. All smoke detectors shall be protected from dust and fumes to avoid affecting the sensitivity of the detectors.

(5) No person shall remove, tamper with, damage, obstruct, or otherwise disturb any fire alarm or fire protection equipment or system under the supervision and control of the Fire Division.

(6) When Shipyard fire alarm systems are disabled for maintenance or impaired, hot work operations shall not be permitted in effected areas.

b. Fire Alarm Test Procedures. These procedures are applicable to Facilities and Maintenance Alarm Technicians and Code 1124 personnel conducting testing and maintenance of fire alarm or protection systems or equipment:

(1) Tests that initiate an alarm to NESCOM shall be conducted only after notifying NESCOM.

(2) The initial test of each system will be tested through the Shipyard fire alarm circuit to NESCOM. Additional tests performed on the same system will be tested to the master box.

(3) NESCOM shall record the occurrence of each test and outage on the Daily Alarm System Log, PSNS 11320/65 (7-93), as required by paragraph 5e.

b. Request for Fire Alarm System Outages

(1) All Shops and Codes

(a) Requests for outages of fire alarm and fire protection systems shall be directed to NESCOM (extension 63393).

(b) Work on fire alarm and fire protection systems shall not proceed without verification that the fire alarm or fire protection system has been disabled.

(c) On completion of work, NESCOM shall be notified that the system is ready to be restored. Personnel shall stand by until Facilities and Maintenance personnel arrive and restore the system.

(2) Code 340.2 shall notify Facilities and Maintenance Alarm Technicians and the Fire Division of all planned movements of barges and ships.

(3) Facilities and Maintenance Officer (Code 910). Shall notify NESCOM of all activities involving fire alarm and fire

protection systems to include the testing, installation, removal, outage, and restoration of fire alarm and fire protection personnel.

(4) Fire Division (Code 1124)

(a) The Fire Division shall maintain managerial responsibility of the fire alarm and fire protection systems in the Shipyard.

(b) When Facilities and Maintenance personnel are unavailable to take fire alarm and fire protection systems off-line, Code 1124 personnel shall provide the services requested.

(5) Naval Emergency Services Communications (NESCOM)

(a) All fire alarm and fire protection system activities shall be recorded by NESCOM on the Daily Fire Alarm System Log, PSNS 11320/65 (7-93).

(b) On receipt of a request for a fire alarm system outage related to testing, installation, removal or temporary outage of a system, NESCOM shall notify Shop 07 Alarm Technicians.

(c) NESCOM will immediately advise the Duty Assistant Fire Chief of all outages affecting fire alarm and fire protection systems.

(d) The dispatcher shall record:

1. The date and time the system is tested, installed, removed, or taken out of service.

2. The alarm box or system affected.

3. The person taking the alarm box or system on- or off-line.

4. Additional information that will assist in identifying the system and the personnel to contact should the system not be restored in the prescribed time.

5. Identification of the NESCOM operator, by operator number, that received the call.

(e) The dispatcher will instruct the caller to call NESCOM at extension 63393 as soon as the system is ready to be restored to service.

(f) When a call is received requesting the system be returned to service, NESCOM will notify Facilities and Maintenance Fire Alarm Technicians.

(g) When notified that the system is restored, NESCOM shall record:

1. The person putting the system back in service.

2. The NESCOM operator receiving the call.

3. The time the system is returned to service.

(h) At 1500 daily, the NESCOM dispatcher will check on the status of all systems not returned to service. The dispatcher will call the person listed as responsible for taking the system off-line to determine the status of the system.

(i) No system will be left out of service on the Daily Alarm System Log, PSNS 11320/65 (7-93), without the dispatcher checking with the person listed as responsible for taking the system off-line. This contact will be appropriately noted on the alarm log.

(j) If the system is to be left out of service for a duration longer than the 24-hour period, the system left out of service will be carried forward to the next day's log.

(6) ROICC and Contract Representative Personnel

(a) Only qualified personnel, such as licensed fire protection systems contractors or fire protection systems maintenance personnel are authorized to modify, repair, or install fire alarm or fire protection systems.

(b) Work on fire alarm and fire protection systems shall not be performed by contract personnel without authorization by Code 1124. Requests for alarm system outages for contract work shall be submitted to the Fire Division and Facilities and Maintenance Department on Outage Request for Contract Work, PSNS 11300/25 (Rev. 4-94).

(c) Notification of building occupants of fire alarm system outages is the responsibility of the contract representative.

VOLUME III - FIRE PROTECTION SYSTEMS AND EQUIPMENT; OPERATION, INSPECTION, TESTING, MAINTENANCE REQUIREMENTS, AND RESPONSIBILITY

CHAPTER 3 - SHIPYARD FIRE ALARM SYSTEM

Ref: (a) NAVFAC MO-117, Maintenance of Fire Protection Systems

1. Purpose. This chapter identifies inspection, testing, and maintenance requirements and responsibility for the Shipyard Fire Alarm System.

2. Policy

a. Fire Alarm Box Identification

(1) To facilitate identifying the location of fire alarm boxes, the Shipyard Fire Alarm System is divided into seven districts, and each district is divided into sub-zones. Permanent alarm boxes are identified by a three or four-digit number. The first number identifies the district; the second number identifies the sub-zone; the third and fourth digit identifies the specific location of the fire alarm box in the district.

(2) A two-digit code system is used to assign temporary boxes to dry docks, piers, nuclear facilities, and other temporary locations. Assignments of temporary fire alarm boxes will be as follows:

Dry Dock Number	Alarm Box Code	Pier Number	Alarm Box Code
1	11, 12, 13, 14		
2	21, 22, 23, 24		
3	31, 32, 33, 34	3	35, 36, 37, 38, 39
4	41, 42, 43, 44	4	45, 46, 47, 48, 49
5	51, 52, 53, 54	5	55, 56, 57, 58, 59
6	61, 62, 63, 64	6	65, 66, 67, 68, 69
		7	75, 76, 77, 78, 79

(3) To the extent possible, even numbers will be assigned to the west side and odd numbers to the east side of the pier or dry dock.

(4) Series 81-89 boxes will be used to identify nonspecific, nonnuclear locations.

Enclosure (1)

(5) Series 91-99 boxes will be used to identify nonspecific nuclear locations.

b. General Requirements

(1) Alarm boxes shall not be moved, disconnected, or removed by any other trade or shop except Facility and Maintenance Fire Alarm Technicians and the Fire Division.

(2) Under no circumstances shall anyone other than Fire Division or Facilities and Maintenance Fire Alarm Technicians have in their possession any keys to the building fire alarm systems or deactivate any fire or suppression system in their building or facility.

(3) The installation, removal, and temporary outage of all permanent and temporary Shipyard fire alarm boxes will be in accordance with Volume 3, Chapter 2.

c. Responsibility. The inspection, testing, and maintenance of the Shipyard Fire Alarm System shall be in accordance with reference (a) and Exhibit III-4-1 of this manual.

(1) Facilities and Maintenance Officer (Code 910)

(a) Maintenance and repair of the Shipyard Fire Alarm System shall be the responsibility of Facilities and Maintenance.

(b) Facilities and Maintenance shall provide temporary fire alarm boxes connected to the Shipyard fire alarm circuit at all industrial piers and dry docks, where required, or as directed by the Fire Division.

(c) Custody of temporary fire alarm boxes and code wheels will be the responsibility of Facilities and Maintenance Department.

(d) Installation of proper code wheels and shore service cables shall be the responsibility of Facilities and Maintenance Department. Distinctive yellow-colored cables will be used for shore connection.

(e) Facilities and Maintenance Department shall be responsible to make connection to the Shipyard fire alarm system, test boxes for proper operation, and notify NESCOM of the location and number of the fire-alarm box.

(f) Upon removal, Facilities and Maintenance Department shall restore continuity of the Shipyard fire alarm system, test the circuit, and notify NESCOM that the box has been removed.

(2) Fire Division (Code 1124) shall test all permanent and temporary fire alarm boxes quarterly.

(3) Naval Emergency Services Communication (NESCOM)

(a) Monitor and record all activity of the Shipyard Fire Alarm System in accordance with Volume 3, Chapter 2.

(b) Take daily readings of the Shipyard Fire Alarm System noting high-ground readings or trouble indications. Problems will be reported to Facilities and Maintenance Fire Alarm Technicians immediately for repair.

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VOLUME III - FIRE-PROTECTION SYSTEMS AND EQUIPMENT; OPERATION, INSPECTION, TESTING, MAINTENANCE REQUIREMENTS, AND RESPONSIBILITY

CHAPTER 4 - FIRE ALARM AND DETECTION SYSTEMS

Ref: (a) NAVFAC MO-117, Maintenance of Fire Protection Systems
(b) National Fire Protection Association (NFPA) 72, National Fire Alarm Code
(c) ASME A17.1, Safety Code for Elevators and Escalators

1. Purpose. This chapter provides requirements and responsibilities to ensure a reasonable degree of protection of life and property from fire through an established program of inspection, testing, and maintenance of fire alarm and detection systems in buildings, temporary facilities, and aboard ship.

2. Policy

a. General Operation Requirements

(1) Fire alarm and detection systems shall be maintained in normal condition at all times and shall be restored to service as promptly as possible after each test or alarm.

(2) Manually operated actuation devices shall be unobstructed, conspicuous and readily accessible, and located in the normal path of exit.

b. General Inspection, Testing, and Maintenance Requirements for Manual Fire Alarm Boxes and Detection Systems

(1) All fire alarm and fire detection systems shall be subjected to initial acceptance testing and recurring inspection and testing in accordance with references (a) and (b), and this manual.

(2) Master Fire Alarm Boxes shall be inspected, tested, and maintained in accordance with references (a) and (b) and exhibit III-4-1 of this manual.

(3) Manual Fire Alarm Boxes shall be inspected, tested, and maintained in accordance with references (a) and (b) and exhibit III-4-1 of this manual.

(4) Smoke Detectors. Smoke detectors shall be inspected, tested, and maintained in accordance with references (a) and (b) and exhibit III-4-1 of this manual. Smoke detectors in family housing shall be tested by the occupant at least once a month and

shall be cleaned at least annually. Training to perform this function shall be provided by the Fire Division during annual * housing inspection. Code 800 will ensure testing of smoke detectors in each individual room is accomplished semiannually and batteries replaced annually. This will be documented on BEQ, BOQ Individual Room Smoke Detector Test, PSNS 11320/67 (9-95), and completed forms will be forwarded to Code 1124.

(5) Heat Detectors shall be inspected, tested, and maintained in accordance with references (a) and (b) and exhibit III-4-1 of this manual.

(6) Annunciator Panels and Alarm-Indicating Devices shall be inspected, tested, and maintained in accordance with references (a) and (b) and exhibit III-4-1 of this manual.

c. Fire Alarm Systems Aboard Ship shall be provided, inspected, tested, and maintained in accordance with Volume VI, Chapter 5, paragraph 3b.

EXHIBIT III-4-1
SUMMARY OF FIRE ALARM AND DETECTION SYSTEM INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

	ITEM	FREQ	ASSIGN	PROCEDURE
	MASTER FIRE ALARM BOX (CODED)			
*	Fire Alarm Box	Quarter	**N321**	Conduct operational test of all permanent and temporary master fire alarm boxes.
*	Fire Alarm Box	**Quarter**	**N321**	Conduct operational test of all permanent fire alarm boxes for radiological buildings and facilities.
*	Fire Alarm Box	**Quarter**	**N321**	Conduct test of temporary master fire alarm boxes for nuclear submarines, and radiological buildings.
	MANUAL FIRE ALARM BOX			
*	Permanent Manual Fire Alarm Box	Annual	**N321**	Conduct operational test of manual fire alarm boxes and signaling circuits in all permanent buildings.
*	Temporary Manual Fire Alarm Box	**Quarter**	**N321**	Conduct operational test of manual fire alarm boxes and signaling circuits aboard nuclear submarines.
	Permanent Manual Fire Alarm Box	Annual	910	Conduct operational test of manual fire alarm boxes and signaling circuits in Buildings 839, 880, 983, and Tunnel 4.
	Temporary Manual Fire Alarm Box	As Needed	900	Conduct operational test of manual fire alarm boxes and signaling circuits in temporary Production facilities. Supervised manual fire alarm systems shall be tested initially and annually thereafter. Non-supervised manual fire alarm systems shall be tested initially and every two months thereafter for reliability and adequacy.

EXHIBIT III-4-1
SUMMARY OF FIRE ALARM AND DETECTION SYSTEM INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
SMOKE DETECTORS			
Smoke Detectors	Annual	910 900	Smoke detectors shall be tested annually to ensure each detector is operative and produces the intended response.
Detector Sensitive Test	As needed	910 900	Detector sensitivity shall be checked within one year after installation and every alternate year thereafter. After the second required calibration test, if sensitivity tests indicate that the detector has remained within its listed and marked sensitivity range, the length of time between calibration tests shall be permitted to be extended not to exceed 5 years.
Detector Cleaning	As needed	910 900	Detectors shall be periodically cleaned as required by the manufacturer and the local ambient conditions. Detector sensitivity test shall be performed on detectors that have been partially disassembled or washed.
HEAT DETECTORS			
Restorable Heat Detectors	Annual	910 900	Heat test with a heat source per manufacturer's recommendations for response within 1 minute. Precaution should be taken to avoid damage to the nonrestorable fixed-temperature element of a combination rate-of-rise/fixed-temperature element.

EXHIBIT III-4-1
SUMMARY OF FIRE ALARM AND DETECTION SYSTEM INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Non-Restorable Heat Detectors	Annual	910 900	Do not heat test. Test mechanically and electrically for function.
ANNUNCIATOR PANELS			
Remote Annunciator	Annual	900 910 1124	Verify for proper operation. Building 983
Remote Annunciator	Annual	910	Building 839, 880, Tunnel 4, verify for proper operation.
CONTROL UNIT			
Lamps and LEDs	Annual	900 910 1124	Illuminate.
* Secondary Power Supply	Annual	900 910	Disconnect all primary (main) power supplies and verify that required trouble indication for loss of primary power occurs. Operate general alarm systems for a minimum of five minutes. Reconnect primary (main) power supply at end of test. Conduct in conjunction with annual fire evacuation.
Fuses	Annual	900 910	Remove fuse and verify rating and supervision.
ALARM NOTIFICATION APPLIANCES			
Audible	Annual	900 910 1124	Verify for adequacy of alarm signal.
Visible	Annual	900 910 1124	Verify device locations are visible. Confirm that no floor plan changes affect visibility of signal.

EXHIBIT III-4-1
SUMMARY OF FIRE ALARM AND DETECTION SYSTEM INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Public Address Speakers	Annual	900 910 1124	Verify voice clarity.
BATTERY MAINTENANCE			
Sealed Lead Acid	Annual	910 900	Conduct Charger Test. With batteries fully charged and connected to the charger, measure the voltage across the batteries. The voltage should be 2.30 volts per cell +/- .02 volts, or as specified by the manufacturer. Replace battery every 4 years.
Sealed Lead Acid	Annual	900 910	Conduct Discharge Test (30 Minute). With the battery charger disconnected, load test the batteries. The voltage level shall not fall below the level specified. Utilize an artificial load equal to the full fire alarm load to conduct test.
* Sealed Lead Acid	Semi-Annual	900 910	Conduct Load Voltage Test. With the battery charger disconnected, measure the terminal voltage while supplying the maximum load required. Utilize an artificial load equal to the full fire alarm load to conduct test for duration of time sufficient to document readings. The float voltage shall not fall below 2.05 volts per cell.

EXHIBIT III-4-1
SUMMARY OF FIRE ALARM AND DETECTION SYSTEM INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
* Lead Acid	Monthly	900 910	Conduct visual inspection of batteries for corrosion or leakage. Check and ensure tightness of connections. If necessary, clean and coat the battery terminals or connections. Visually inspect electrolyte level.
Lead Acid	Annual	900 910	Conduct Charger Test. With the batteries fully charged and connected to the charger, measure the voltage across the batteries. The voltage shall be 2.30 volts per cell +/- .02 volts, or as specified by the manufacturer.
Lead Acid	Semi-Annual	900 910	Conduct Discharge Test (30 Minute). With the battery charger disconnected, load test the batteries. The voltage level shall not fall below the level specified. Utilize an artificial load equal to the full fire alarm load to conduct test.
Lead Acid	Semi-Annual	900 910	Conduct Load Voltage Test. With the battery charger disconnected, measure the terminal voltage while supplying the maximum load required. The battery shall not fall below 2.05 volts per cell. An artificial load, equal to the full fire alarm load, shall be utilized to conduct this test.
Lead Acid	Semi-Annual	900 910	Measure Specific Gravity. The specific gravity of all cells shall be measured. The specific gravity shall be within the range specified by the manufacturer.

Enclosure (1)

EXHIBIT III-4-1
SUMMARY OF FIRE ALARM AND DETECTION SYSTEM INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Nickel Cadmium	Annual	900 910	Conduct Charger Test. With the batteries fully charged and connected to the charger, place an amp meter in series with the battery under charge. The charging current shall be in accordance with the manufacturer's recommendations. In the absence of specific information, this shall be 1/30th to 1/25th of the battery rating.
Nickel Cadmium	Annual	900 910	Conduct Discharge Test (30 Minute). With the battery charger disconnected, load test the batteries. The voltage level shall not fall below the level specified. Utilize an artificial load equal to the full fire alarm load to conduct test.
Nickel Cadmium	Semi-Annual	900 910	Conduct Load Voltage Test. With the battery charger disconnected, measure the terminal voltage while supplying the maximum load required. The battery shall not fall below 1.42 volts per cell. If possible, cells shall be measured individually. An artificial load, equal to the full fire alarm load, shall be utilized to conduct this test.
TROUBLE SIGNALS			
Audible and Visual Signals	Annual	910 900	Verify operation of panel trouble signals and ring back feature for systems using a trouble silencing switch which requires resetting.

Enclosure (1)

EXHIBIT III-4-1
SUMMARY OF FIRE ALARM AND DETECTION SYSTEM INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Zone Disconnect Switches	Annual	910 900	When control unit has zone disconnect or isolation switches, verify that each switch performs its intended function and a trouble signal is received when a zone is disconnected.
Ground Fault Monitoring Circuit	Annual	910 900	When system has ground detection feature, verify that ground fault indication is given.
*	**Emergency Lighting Equipment**		
* Battery Operated Emergency Lighting Equipment	Monthly	900 1124	A functional test shall be conducted on every required battery operated emergency lighting system for a minimum of 30 seconds. Equipment shall be fully operational and provide the required lighting for the duration of the test.
* Generator Supplied Emergency Lighting Equipment	Annual	910	A functional test shall be conducted on every required emergency lighting system for a minimum of 30 minutes. Equipment shall be fully operational and provide the required lighting for the duration of the test.
*	**ELEVATORS**		
Phase I and Phase II recall	Annual	900 910	A functional test shall be conducted for Phase I and Phase II emergency recall operation in accordance with reference (c).

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VOLUME III - FIRE PROTECTION SYSTEMS AND EQUIPMENT; OPERATION, INSPECTION, TESTING, MAINTENANCE REQUIREMENTS, AND RESPONSIBILITY

CHAPTER 5 PORTABLE FIRE EXTINGUISHERS

Ref: (a) National Fire Protection Association (NFPA) 10, Portable Fire Extinguishers
(b) OSHA 29 CFR 1910.157, Portable Fire Extinguishers
(c) NAVSEA 0902-018-2010 General Overhaul Specifications for Deep Diving SSBN/SSN Submarines
(d) NAVSEA S9AAO-AB-GOS-010/GSO General Specifications for Overhaul of Surface Ships

1. Introduction. Virtually all fires are small at first and might be extinguished easily if the proper type and amount of extinguishing agent were applied promptly. Portable fire extinguishers are provided for use by building occupants. Their successful use depends on:

a. The extinguisher being accessible and in good working order.

b. The extinguisher being the proper type for the fire.

c. The fire is discovered while it is still small enough for the extinguisher to be effective.

d. The fire is discovered by a person trained and willing to use the extinguisher.

2. Purpose. This chapter provides the requirements and responsibilities to ensure a reasonable degree of protection of life and property from fire through an established program of inspection, testing, and maintenance of portable fire extinguishers in buildings, temporary facilities, piers and dry docks, and aboard ship.

3. Definitions

a. Class A Fires are fires involving ordinary combustible materials such as wood, cloth, paper, etc. Extinguishers used for Class A fires shall be selected from the following types: Water, foam, aqueous film forming foam (AFFF), loaded stream, and multipurpose dry chemical extinguishers.

b. Class B Fires are fires involving flammable liquids, oils, greases, tars, oil-base paints, lacquers, and flammable gases. Extinguishers used for Class B fires shall be selected from the following types: Carbon Dioxide, dry chemical, foam and AFFF extinguishers.

c. Class C Fires are fires involving energized electrical equipment where the electrical nonconductivity of the extinguishing agent is important. Extinguishers used for Class C fires shall be selected from the following types: Carbon dioxide, and dry chemical extinguishers.

d. Class D Fires are fires involving combustible metals such as magnesium, titanium, zirconium, sodium, lithium, and potassium. Extinguishers used for Class D fires shall be types approved by the Fire Division for use on the specific combustible metal hazard.

e. Inspection. A quick check that an extinguisher is available and will operate. It is intended to give reasonable assurance that the extinguisher is fully charged and operable. This is done by seeing that it is in its designated place, that it has not been actuated or tampered with, and that there is no obvious physical damage or condition to prevent its operation.

f. Maintenance. A thorough examination of the extinguisher. It is intended to give maximum assurance that an extinguisher will operate effectively and safely. It includes a thorough examination and any necessary repair or replacement. It will also indicate if hydrostatic testing is required.

g. Nuclear Refueling Complex Areas shall include the interior areas of the complex as well as the immediate exterior areas.

h. Permanent Facilities are buildings with building numbers maintained by Facilities and Maintenance Department(Code 910).

4. Policy. The selection, distribution, inspection, testing, and maintenance of portable fire extinguishers shall be in accordance with references (a) through (d) and this chapter. Additional guidance is provided for portable fire extinguishers aboard ships and submarines in Volume 6, Chapter 5 of this manual.

a. General Requirements

(1) Portable fire extinguishers shall be maintained in a fully charged and operable condition and kept in their designated places at all times.

(2) Portable fire extinguishers weighing less than forty pounds shall have the top of the extinguisher not more than five

feet above the floor. Extinguishers weighing more than forty pounds shall have the top of the extinguisher not more than three and one-half feet above the floor. The clearance between the bottom of the extinguisher and the floor shall not be less than four inches.

(3) Portable fire extinguishers shall be mounted, located, and identified, so that they are readily accessible to personnel.

(4) The portable fire extinguishers required by this chapter shall not be removed, used for fire watch purposes, tampered with, discharged, or otherwise disturbed, except for the purpose of extinguishing fire.

(5) Carbon Dioxide fire extinguishers shall have either have a white dot to denote that they are for emergency use only and are not to be used for fire watch purposes, or a blue dot to denote that they are to be used for fire watch purposes. White dot portable fire extinguishers shall not be used for fire watch purposes.

b. Operation Requirements. Portable fire extinguishers are intended as the first line of defense to deal with fires of limited size. Since many fires are small at origin, the availability and use of proper portable fire extinguishers will, in most cases, facilitate the suppression of incipient fires that might otherwise endanger life and property. However, if a fire occurs, the Fire Division shall be notified immediately. This alarm, or the evacuation of the building shall not be delayed while portable fire extinguishers are being used. Portable fire extinguishers should not be operated unless:

(1) The building is being evacuated.

(2) The Fire Division is being called.

(3) The fire is small and contained.

(4) The way to the exit is clear and you can fight the fire with your back to the exit.

(5) The proper extinguisher is available.

(6) The operator is trained and confident about using the extinguisher.

(7) Special precautions shall be observed by all personnel handling carbon dioxide extinguishers since discharging an extinguisher in a small, poorly ventilated space can result in a high concentration of carbon dioxide which displaces oxygen and may not support life.

c. Selection and Distribution of Extinguishers

(1) General

(a) The selection and distribution of portable fire extinguishers shall be determined by the Fire Division based on classes of anticipated workplace fires and on the size and degree of hazard.

(b) Because the halogenated extinguishing agents, Halon 1211 and 1301, have been identified as Class I ozone depleting substances (ODS), their use is restricted to mission essential applications as defined by the Secretary of the Navy.

1. Effective immediately, procurement of Halon 1211 fire extinguishers is prohibited. Installation of shore-based Halon 1301 fire protection systems is prohibited.

2. Effective 1 January 1996, all Halon 1211 and 1301 portable extinguishers will be turned into the Fire Division for reassignment to the Navy ODS Reserve maintained by Defense Logistics Agency (DLA).

3. Non-mission essential shore-based Halon 1301 fire protection systems will be replaced by 31 December 2000.

(2) Distribution of Extinguishers in Buildings and Facilities shall be in accordance with references (a) and (b) and this manual.

(a) Building protection shall be provided by fire extinguishers suitable for Class A fires.

(b) Occupancy hazard protection shall be provided by extinguishers suitable for Classes A, B, C, or D fires as may be present.

(c) For Class A hazards, portable fire extinguishers shall be distributed so that the travel distance to any extinguisher is 75 feet or less.

(d) For Class B hazards, portable fire extinguishers shall be distributed so that the travel distance to any extinguisher is 50 feet or less.

(e) For Class C hazards, portable fire extinguishers shall be distributed where energized electrical equipment may be encountered that would require a nonconducting extinguishing agent.

(f) For Class D hazards, portable fire extinguishers or other containers of Class D extinguishing agent shall be distributed so that the travel distance to any extinguisher is 75 feet or less. This rule applies to combustible metal working areas where combustible metal powders, shavings, flakes, etc., are generated at least once every two weeks.

(3) Distribution of Extinguishers in Dry Docks, on Piers and Other Exterior Locations. On piers and around dry docks, extinguishers shall be placed in extinguisher stands to provide for one extinguisher at a maximum travel distance of 75 feet. Extinguishers shall be placed so as to be protected from damage and be easily located and accessible.

(4) Distribution of Extinguishers Aboard Ships in Overhaul shall be in accordance with references (c) and (d) and this manual.

(a) Extinguishers shall be installed so that the maximum travel distance to an extinguisher from any interior point of the ship on the same level shall not be more than 50 feet.

* (b) Portable 10-pound carbon dioxide extinguishers shall be the primary means of initially fighting fires.

(5) Distribution of Extinguishers on Transportation Vehicles. Fire extinguishers with a minimum UL rating of 2A, 20B-C shall be installed on the following types of vehicles:

(a) Buses.

(b) Ambulances and all other emergency vehicles assigned to the Fire Division.

(c) Vehicles regularly used to carry explosives, acids, compressed gases, fuel, or other hazardous/dangerous materials.

(d) As provided for in other sections of this manual.

d. Inspection and Maintenance Requirements For Portable Fire Extinguishers

(1) Inspection Frequency. Portable fire extinguishers shall be inspected when initially placed in service and thereafter
* monthly.

(2) Inspection Procedure. Monthly inspection shall provide for a visual inspection of the fire extinguisher to confirm that the fire extinguisher is in its proper location, that it is not blocked, is fully charged, and that it appears to be in good working order. The visual inspection shall:

(a) Confirm that the extinguisher is located in its designated place.

(b) Confirm that access to and visibility of the extinguisher are not obstructed.

(c) Confirm that the operating instructions on the nameplate is legible and facing forward.

(d) Confirm that seals and tamper indicators are intact.

(e) Confirm that the extinguisher is fully charged by observing that the pressure gauge, if provided, is in the normal range.

(3) Inspection Documentation

(a) The inspection of portable fire extinguishers shall be documented by dating and initialing the attached Fire Extinguisher Inspection Record, NAVFAC 11320/2 (3-75).

(b) Inspection tags for extinguishers in dry docks, piers, hose stations, and portable buildings and other exterior areas subject to adverse weather conditions, shall be a one-inch diameter color-coded metal tag stamped with the current monthly due date, (i.e. DUE 1 MAR). Inspection tags will not be marked with the year so the tags can be reused.

(c) Deficiencies noted during the visual inspection of fire extinguishers will be reported to the Fire Division at extension 63124.

(4) Maintenance Frequency. Extinguishers shall be subjected to maintenance procedures annually or when indicated by inspection in accordance with reference (a), paragraph 4-4.

(5) Hydrostatic Testing of Portable Fire Extinguishers. Hydrostatic tests shall be performed on extinguishers at intervals indicated below:

(a) Pressurized water extinguishers shall be hydrostatically tested every five years.

(b) Carbon Dioxide extinguishers shall be hydrostatically tested every five years.

(c) Dry chemical, stored pressure, with mild steel or aluminum shells, cartridge or cylinder operated, with mild steel shells, shall be hydrostatically tested every twelve years.

(d) Fire extinguisher hose assemblies which are equipped with shut-off nozzles shall be tested at the same interval as the extinguisher on which the hose is installed.

e. Responsibility For Inspection, Testing, and Maintenance of Portable Fire Extinguishers. Fire extinguishers shall be inspected, tested, and maintained in accordance with references (a) and (b) and this manual.

(1) Facilities and Maintenance Officer (Code 910) shall provide, test, and conduct annual maintenance, and install fire extinguishers in all permanent facilities. Shop 03 shall provide monthly inspection of portable fire extinguishers in all electrical substations.

(2) Production Resources Officer (Code 900) shall provide, test, and conduct annual maintenance and install fire extinguishers in all Production areas assigned.

(a) Shop 38RFC will be responsible for the installation and monthly inspection of all portable fire extinguishers installed at Nuclear Refueling Complex Areas.

(b) Shop 98 shall inspect portable fire extinguishers on all cranes under their cognizance.

(c) Shop 99 shall inspect, test, and maintain portable fire extinguishers in accordance with Volume VI, Chapter 5 of this manual.

(d) Code 333. Portable fire extinguishers for inactive ships shall be installed and inspected by Code 333.

(3) Ship's Force. Portable fire extinguishers issued to ships undergoing repair or overhaul and living and work barges assigned to Ship's Force shall be responsible to provide monthly inspection of all portable fire extinguishers.

(4) Barge Maintenance (Code 340) shall provide monthly inspection of all portable fire extinguishers on all barges under their cognizance, not assigned to Ship's Force.

(5) Operators of Transportation Vehicles provided with portable fire extinguishers shall inspect fire extinguishers monthly.

(6) Building Fire Wardens

(a) Provide monthly inspections of portable fire extinguishers in areas assigned.

(b) Notify the Fire Division at extension 63124 of fire extinguishers requiring exchange or service.

(7) Fire Division (Code 1124)

(a) Designate the type, number and location of portable fire extinguishers to meet the requirements of references (a) and (b).

(b) Weigh portable carbon-doixode fire extinguishers located in permanent buildings on a semiannual basis.

(c) Replace or service extinguishers identified by building fire wardens as deficient.

(d) At the request of Department Fire Wardens, the Fire Division shall:

1. Provide employees training to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting.

2. Provide training to personnel assigned extinguisher inspection responsibility.

(e) Provide oversight and enforcement of the above assigned responsibilities and procedures.

VOLUME III - FIRE PROTECTION SYSTEMS AND EQUIPMENT; OPERATION, INSPECTION, TESTING, MAINTENANCE REQUIREMENTS, AND RESPONSIBILITY

CHAPTER 6 AUTOMATIC SPRINKLER SYSTEMS

Ref: (a) NAVFAC MO-117, Maintenance of Fire Protection Systems
(b) NFPA 25, Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
(c) NFPA 13A, Recommended Practice For Inspection and Maintenance of Sprinkler Systems
(d) OSHA 29 CFR 1910.159, Automatic Sprinkler Systems

1. Purpose. This chapter provides the general operating requirements for automatic sprinkler systems and provides the requirements and responsibilities to ensure a reasonable degree of protection of life and property from fire through an established program of inspection, testing, and maintenance of automatic sprinkler systems.

2. Introduction

a. An automatic sprinkler system provides for the extinguishment of fire in a building by the prompt and continuous discharge of water directly upon burning material. This is accomplished by means of an arrangement of pipes to which are attached outlet devices known as automatic sprinklers. These sprinklers are so constructed as to open automatically whenever the surrounding temperature reaches a determined point.

b. In general, there are two types of automatic sprinkler systems; dry-pipe systems and wet-pipe systems. Wet-pipe systems are used in locations that are not subject to freezing temperatures and the installed pipe lines contain water under pressure. Dry-pipe systems are used in buildings, or portions thereof, that are subject to freezing temperatures. In the latter type of system, water is admitted to the pipes automatically after elevated ceiling temperature has caused the automatic sprinkler to operate.

c. The inspection, testing, and maintenance of automatic sprinkler systems is vital to their performance in emergencies. Without an Inspection, Testing, and Maintenance Program the best designed systems can fail. Well maintained sprinkler systems are highly reliable, and provide protection for personnel as well as Shipyard property.

3. Policy

a. General Operating Requirements

(1) Sprinkler control valves shall be maintained in the open position, either guarded by a tamper alarm or locked.

(2) In the event of a fire in which sprinkler heads are fused, the Post Indicator Valve (PIV) shall not be closed until so directed by the Senior Fire Officer On-Scene.

(3) In the event of the actuation of sprinkler head(s) caused by accident, the sprinkler system shall not be secured unless the operation is obliviously accidental. In these cases, the PIV shall be secured and the main drain valve opened to minimize water damage.

(4) Damaged or leaking sprinkler systems shall be reported immediately to the Fire Division.

(5) Access to and clearance around post indicator valves, Fire Department connections, and system risers shall be maintained.

(6) No material will be hung from sprinkler system piping.

(7) A clearance of 18 inches shall be maintained between sprinkler heads and storage of materials piled less than 15-feet high. A clearance of 36 inches shall be maintained between sprinkler heads and storage of materials piled over 15-feet high. A clearance of 36 inches shall be maintained for storage of hazardous materials, regardless of storage height.

(8) Sprinkler system heads shall not be concealed or obstructed by ceiling tiles or other structural members which would inhibit, prevent, or delay the proper operation of the head(s).

(9) Facilities and Maintenance Department shall maintain a supply of not less than 6 spare sprinklers and a special sprinkler wrench in a cabinet located in the building.

(10) Sprinklers subject to mechanical damage shall be provided with approved sprinkler guards.

(11) Sprinkler heads in paint spray booths shall be protected in accordance with Volume IV, Chapter 8, paragraph 2c(5)(f) of this manual.

b. Sprinkler System Impairments

(1) Sprinkler systems shall be maintained in an operating condition at all times. The replacement of sprinkler heads and restoration of service shall be affected immediately upon extinguishment of the fire or determination of accidental operation.

(2) Sprinkler system outages shall be in accordance with Volume III, Chapter 2, of this manual.

(3) Planned impairments to sprinkler systems shall be as short in duration as practical. All necessary parts and personnel shall be assembled prior to removing the system from service. When it is essential that sprinkler systems be impaired for an overnight period, measures shall be effected and approved by the Fire Division to maintain the maximum possible degree of protection during the entire period of the outage.

(4) Electrical power shall not be secured to air compressors that provide air pressure to dry pipe and pre-action sprinkler systems.

c. Inspection, Testing, and Maintenance Requirements of Sprinkler Systems shall be in accordance with references (a) through (d) which are summarized in Exhibit III-6-1.

d. Inspection, Testing, and Maintenance Responsibilities

(1) Facilities and Maintenance Officer (Code 910)

(a) Coordinate scheduling of inspection and testing requirements with Code 1124 to eliminate redundancy.

(b) Conduct annual inspection, tests, and maintenance of all sprinkler systems as indicated in Exhibit III-6-1.

(c) Conduct annual trip tests of all dry-pipe and pre-action sprinkler systems as indicated in Exhibit III-6-1.

(d) Maintain responsibility for the inspection and testing of all sprinkler systems in Building 839 and Building 880. Building 985 and Tunnel 4.

(e) Repair sprinkler systems in accordance with references (a) through (c). Once repairs are completed, conduct tests that will ensure proper operation and restoration of full fire-protection equipment capabilities. Tests shall be witnessed by the Fire Division.

(f) Sprinkler system inspection, testing, and maintenance shall be documented in a maintenance log established for each system. Documentation of all sprinkler system inspection, test, and maintenance shall be available for review by Code 1124.

(2) Fire Division (Code 1124)

(a) Coordinate scheduling of inspection and testing requirements with Code 910 to eliminate redundancy.

(b) Conduct quarterly inspection and testing of wet and dry pipe sprinkler systems in accordance with Exhibit III-6-1.

(c) Document sprinkler system inspections and tests performed by the Fire Division on Sprinkler System Test Record, PSNS 11320/13 (Rev. 8-93).

(d) Witness tests conducted by Facilities and Maintenance personnel after repairs are completed to ensure proper operation and restoration of full fire-protection equipment capabilities.

e. Sprinkler Systems in Trailers Aboard Surface Ships

(1) All mobile office trailers place aboard carrier-type ships shall have an installed sprinkler system hydraulically designed to deliver 0.1 gal/min square foot. Operation shall sound an audible alarm outside the trailer.

(2) Shop 06 shall test the audible alarm by flowing water through the water-motor gong prior to trailers being occupied and thereafter every quarter.

f. Existing Sprinkler Systems in Buildings which are not required by criteria, shall be maintained in service.

EXHIBIT III-6-1
SUMMARY OF SPRINKLER SYSTEM INSPECTION TESTING, AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

Item	Freq	Assign	Procedure
ALL SYSTEMS			
Gauges	Monthly	1124	Gauges shall be inspected monthly to ensure that they are in good condition and that normal air and/or water pressures are being maintained.
Control Valves	Monthly	1124	Control valves shall be inspected to verify that they are: (1) In the normal open position; (2) Properly locked or supervised; (3) Accessible; (4) Provided with the appropriate wrench; (5) Free from external leaks; (6) Provided with appropriate identification.
Alarm Devices	Monthly	1124	Alarm devices shall be inspected to verify that they are free of physical damage.
Post Indicator Valve (PIV)	Quarter	1124 910	Open PIV until spring torsion is felt, indicating the rod has not become detached from the valve. Back valve one-quarter turn from the wide open position to prevent jamming.
General Condition	Annual	1124 910	Sprinklers shall be visually inspected to verify that they are free of corrosion, obstructions to spray patterns, foreign materials, paint, and physical damage. Sprinkler hangers and seismic braces shall be inspected to verify that they are not damaged or loose. Piping shall be inspected to verify that it is in good condition and free of mechanical damage, leakage, or corrosion.

EXHIBIT III-6-1
SUMMARY OF SPRINKLER SYSTEM INSPECTION TESTING, AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

Item	Freq	Assign	Procedure
F.D. Conn.	Month	1124	Fire Department Connections shall be inspected to verify that: (1) They are visible and accessible; (2) Couplings or swivels are not damaged and rotate smoothly; (3) Plugs or caps are in place and are not damaged; (4) Gaskets are in place and are not damaged; (5) Identification signs are in place; (6) The check valve is not leaking.
Gauges	5 Year	910	Gauges shall be replaced every 5 years or tested by comparison with a calibrated gauge. Gauges not accurate to within 3% shall be recalibrated or replaced.
* Control Valves	Annual	910	Operate OS&Y and post indicator valves by completely closing and opening valves. Lubricate all valve stems. The valve shall be operated to distribute the lubricant. Verify operation of tamper alarm, if provided.
Examine For Blockage	5 years or as needed	910	An Obstruction investigation shall be conducted whenever: (1) Discharge of obstructive material during routine water tests; (2) Foreign materials are found in dry pipe or check valves; (3) Heavy discoloration of water during drain tests or plugging of inspector test valve; (4) Plugging of sprinklers; (5) Plugged piping in system during dismantling, during building alterations; (6) Failure to flush yard piping following new installations or repairs; (7) Abnormally frequent false-tripping of dry-pipe valve(s).

Enclosure (1)

EXHIBIT III-6-1
SUMMARY OF SPRINKLER SYSTEM INSPECTION TESTING, AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

Item	Freq	Assign	Procedure
WET-PIPE SPRINKLER SYSTEMS			
Water Flow Alarms	Quarter	1124 910	Water-flow devices and pressure switches that provide audible or visual signals, including the water-motor gong, shall be tested. Testing of wet-pipe systems shall be accomplished by opening the Inspector Test Valve.
Main Drain	Quarter	1124 910	Main Drain tests shall be accomplished in the following manner; (1) Record pressure indicated by the supply water pressure gauge; (2) Fully open the main drain valve; (3) After flow is stabilized, record residual pressure indicated by the supply water pressure gauge; (4) Close the main drain valve (slowly); (5) Record the time required for supply water pressure to return to normal static pressure; (6) Compare pressures with previous tests.
Building	Annual	1124 910	Before and during freezing weather, buildings shall be inspected to verify that windows, skylights, doors, and other openings will not expose sprinkler piping to freezing and to assure that adequate heat (minimum 40°F.) is available.
DRY-PIPE SPRINKLER SYSTEMS			
Water Flow Alarms	Quarter	1124 910	Water-flow devices and pressure switches that provide audible or visual signals shall be tested. Testing of dry-pipe systems shall be accomplished by using the bypass connection.

Enclosure (1)

EXHIBIT III-6-1
SUMMARY OF SPRINKLER SYSTEM INSPECTION TESTING, AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

Item	Freq	Assign	Procedure
* Low Air Pressure Alarms	Quarter	1124 910	Low air pressure alarms shall be tested as outlined for each system on Sprinkler System Test Record, PSNS 11320/13 (Rev. 8-93).
* Air Compressor	Annual	910	Automatic air pressure maintenance devices, if provided, shall be tested yearly at the time of the annual dry pipe valve trip test, in accordance with the manufacturer's instructions.
Water Motor Gong	Quarter	1124 910	The water-motor gong shall be tested by using the water-motor gong test valve provided.
Trip Test Dry-Pipe Valve	Annual	910	Prior to trip testing dry-pipe systems, conduct Main Drain Test. Annual trip tests of dry-pipe sprinkler systems shall be conducted in the spring as follows: (1) Close main control valve; (2) Open 2-inch drain; (3) Open main-control valve until 5 pounds pressure shows on the gauge; (4) Close 2-inch drain valve (slowly); (5) Open inspector test valve on the system; (6) As soon as the dry-pipe valve trips, close the main-control valve and open the 2-inch drain; (7) Record initial air and water pressures, air pressure at the trip point, and the time required for tripping; (8) Examine and clean dry-pipe valve interior, replace facings and gaskets, if needed; (9) Reset dry-pipe valve and open control valve.

Enclosure (1)

EXHIBIT III-6-1
SUMMARY OF SPRINKLER SYSTEM INSPECTION TESTING, AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

Item	Freq	Assign	Procedure
Trip Test Dry Pipe Valve	Three Year	910	Every third year and whenever the system is altered, the dry-pipe valve shall be trip tested with the control valve wide open.
Main Drain	Quarter	1124 910	Before and during freezing weather, all low-point drains on dry-pipe systems shall be drained to remove all moisture.
PRE-ACTION SPRINKLER SYSTEMS			
Pre-Action Detection Systems	Semi-Annual	910	Detection systems connected to pre-action systems shall be tested biannually.
Water Flow Alarms	Quarter	910	Alarms including water-motor gongs shall be tested quarterly in accordance with procedures recommended by the manufacturer.
Main Drain	Quarter	910	Main Drain tests shall be accomplished in the following manner; (1) Record pressure indicated by the supply water-pressure gauge; (2) Fully open the main-drain valve; (3) After flow is stabilized, record residual pressure indicated by the supply water-pressure gauge; (4) Close the main-drain valve (slowly); (5) Record the time required for supply water pressure to return to normal static pressure; (6) Compare pressures with previous tests.
Enclosure	Annual	910	Assure pre-action valve enclosure is maintained at a minimum temperature of 40 degrees F.
Trip Test Pre-Action Valve	Annual	910	Pre-action valve shall be full-flow trip tested annually in warm weather in accordance with the manufacturer's instructions.

Enclosure (1)

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VOLUME III - FIRE-PROTECTION SYSTEMS AND EQUIPMENT; OPERATION, INSPECTION, TESTING, MAINTENANCE REQUIREMENTS, AND RESPONSIBILITY

CHAPTER 7 CARBON DIOXIDE, HALON, AND DRY CHEMICAL EXTINGUISHING SYSTEMS

Ref: (a) NAVFAC MO-117, Maintenance of Fire Protection Systems
(b) National Fire Protection Association (NFPA) 12, Carbon Dioxide Extinguishing Systems
(c) NFPA 12A, Halon 1301 Fire Extinguishing Systems
(d) NFPA 17, Dry Chemical Extinguishing Systems

1. Purpose. This chapter provides the requirements and responsibilities to ensure a reasonable degree of protection of life and property from fire through an established program of inspection, testing, and maintenance of carbon dioxide, halon and dry chemical extinguishing systems.

2. Policy

a. General. Systems shall be maintained in a fully operating condition at all times. Use, impairments, and restoration of these systems shall be reported to the Fire Division in accordance with Volume III, Chapter 2 of this manual. Deficiencies or impairments shall be corrected immediately.

b. Carbon Dioxide Extinguishing Systems

(1) General Requirements

(a) Carbon Dioxide hose stations will normally be operated by Fire Division trained personnel.

(b) Personnel performing inspection, testing, and maintenance procedures with carbon dioxide extinguishing systems shall receive training regarding carbon dioxide safety issues.

(2) Inspection, Testing, and Maintenance Responsibility. Carbon dioxide extinguishing systems shall be inspected, tested, and maintained in accordance with the manufacturer's maintenance manual, references (a) and (b), and Exhibit III-7-1 of this manual.

c. Halon Extinguishing Systems

(1) General Requirements

(a) Penetrations made through the halon-protected enclosure shall be sealed immediately. The method of sealing shall restore the original fire resistance rating and tightness of the enclosure.

(b) Personnel working in a halon-protected enclosure shall receive training regarding halon safety issues.

(2) Inspection, Testing, and Maintenance Responsibility. Semiannually, halon extinguishing systems shall be inspected, tested and documented for proper operation. Systems shall be inspected, tested, and maintained in accordance with the manufacturer's maintenance manual, references (a) and (c), and Exhibit III-7-2 of this manual.

d. Dry Chemical Extinguishing Systems. Inspection, testing, and maintenance shall be conducted in accordance with the manufacturer's maintenance manual, references (a) and (d), and Exhibit III-7-3 of this manual.

EXHIBIT III-7-1
SUMMARY OF CARBON DIOXIDE SYSTEM INSPECTION, TESTING, AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
ALL CARBON DIOXIDE EXTINGUISHING SYSTEMS			
Hose and Flexible Connectors	Annual	910 900	All system hoses including those used as flexible connectors shall be examined annually for damage. If visual examination identifies a deficiency, the hose shall be replaced or tested.
Hose and Flexible Connectors	5 Year	910 900	All system hoses including those used as flexible connectors shall be hydrostatically tested every five years. High-pressure systems shall be tested at 2500 psi. Low-pressure systems shall be tested at 900 psi. Hoses for hand lines shall be checked for electrical continuity between couplings. Hose assemblies passing the test shall be suitably marked with the date of the test on the hose.
HIGH PRESSURE CARBON DIOXIDE EXTINGUISHING SYSTEMS			
Cylinders	Bi-Annual	910 900	All high-pressure cylinders shall be weighed and the date of the last hydrostatic test noted. If cylinder shows a loss in net content of more than 10 percent, it shall be replaced.
Cylinders	As Stated	910 900	Cylinders shall be hydrostatically tested at a minimum of 3,000 psi: (1) If discharged after five years from date of last hydrostatic test; (2) If not discharged after twelve years from date of last test, discharge and perform hydrostatic test.

Enclosure (1)

EXHIBIT III-7-1
SUMMARY OF CARBON DIOXIDE SYSTEM INSPECTION, TESTING, AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Cylinders	Annual	910 900	Conduct actuating and operating test of gas cylinders.
Devices	Monthly	910 900	Inspect to see that all nozzles are clear and in the proper position and that all operating controls are properly set.
LOW PRESSURE CARBON DIOXIDE EXTINGUISHING SYSTEMS			
Liquid Level	As Stated	910	Inspect liquid level in low-pressure storage tanks weekly unless system is supervised, in which case, check annually. If at any time a container shows a loss of more than ten percent, it shall be refilled, unless the minimum gas requirements are still provided.
Devices and Connections	Monthly	910	Check to see that all nozzles are clear and in the proper position and that all operating controls are properly set. Check for leaks on all devices and connections under continuous pressure, including valve-packing glands, screwed connections, and safety-relief devices.
Tank Alarm	Bi-Annual	910	Test the tank-alarm pressure switch and the operation of the alarm bell or light.
Frangible Discs	5 Year	910	Replace frangible discs on the storage tanks.
Equipment	As Stated	910	Maintain refrigeration equipment according to manufacturer's instructions.

EXHIBIT III-7-2
SUMMARY OF HALON SYSTEM INSPECTION, TESTING, AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Enclosure	Bi-Annual	1124	The halon-protected enclosure shall be thoroughly inspected to determine if penetrations or other changes have occurred that could adversely affect halon leakage. If the inspection indicates that conditions could result in inability to maintain the halon concentration, the condition shall be corrected.
Refillable Containers	Bi-Annual	910	The agent quantity and pressure of refillable containers shall be checked. If container shows a net loss of more than 5 percent or a loss in pressure of 10 percent, it shall be refilled or replaced. The weight and pressure of the container shall be recorded on a tag attached to the container. All halon removed from refillable containers during service or maintenance procedures shall be collected for recycling.
Non-Refillable Containers	Bi-Annual	910	Factory charged nonrefillable containers that do not have a means of pressure indication shall be weighed. If a container shows a loss in net weight of more than five percent, it shall be replaced. The weight and pressure of the container shall be recorded on a tag attached to the container. All factory charged nonrefillable containers removed from useful service shall be returned for recycling of the agent.

EXHIBIT III-7-2
SUMMARY OF HALON SYSTEM INSPECTION, TESTING, AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Detection	Bi-Annual	910	All detectors are to be checked for proper alarm, supervision, and trouble functions.
Actuation	Bi-Annual	910	Remove automatic actuation controls from agent containers. Test detection system to operate the necessary circuit(s) to simulate agent release. Operate all manual devices to simulate agent release.
Containers	Bi-Annual	910	Examine all containers for evidence of corrosion or mechanical damage. Check container bracketing and supports to determine that their condition is satisfactory.
Piping and Nozzles	Bi-Annual	910	Examine piping for any evidence of corrosion. Examine pipe hangers and straps to see that the piping is securely supported. Check nozzles for proper position and alignment and determine that orifices are clear and unobstructed. Check nozzle seals, if applicable, for signs of deterioration and replace if necessary.
Auxiliary Equipment	Bi-Annual	910	Operate all auxiliary and supplementary components such as switches, doors and window releases, interconnected valves, damper releases, air-handling equipment shutdown, and supplementary alarms to ensure that they are in proper operating condition.

EXHIBIT III-7-3
SUMMARY OF DRY CHEMICAL EXTINGUISHING SYSTEM INSPECTION, TESTING, AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
System	Monthly	1124 900	An inspection shall be conducted which shall include: (1) The extinguishing system is in its proper location; (2) Manual actuators are not obstructed; (3) Maintenance tag or certification is up to date and in place; (4) Tamper indicators and seals are intact; (5) No obvious physical damage or condition exists that may prevent operation.
System	Bi-Annual	910 900	Examine all detectors, expellant gas container(s), agent container(s), releasing devices, piping, hose assemblies, nozzles, alarms, and all auxiliary equipment.
Piping	Bi-Annual	910 900	Verify that agent distribution piping is not obstructed.
Dry Chemical	Bi-Annual	910 900	Examine the dry chemical for evidence of caking. If evidence of caking is found, the dry chemical shall be discarded and the system recharged in accordance with manufacturer instructions. If the dry chemical in stored pressure systems, it does not require semiannual examination, but shall be examined every 6 years.
System	Bi-Annual	910 900	Test detection systems, releasing devices, alarms, manual stations, and other associated equipment.

Enclosure (1)

EXHIBIT III-7-3
SUMMARY OF DRY CHEMICAL EXTINGUISHING SYSTEM INSPECTION, TESTING, AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Cylinders	As Stated	910 900	Dry chemical containers, auxiliary pressure containers and hose assemblies (if applicable) shall be subjected to a hydrostatic pressure test every 12 years. Contact Fire Division for applicable exceptions.
Sensing Elements	Bi-Annual	910 900	Fixed temperature sensing elements of the fusible metal alloy type shall be replaced annually or more frequently as necessary.

VOLUME III - FIRE-PROTECTION SYSTEMS AND EQUIPMENT; OPERATION, INSPECTION, TESTING, MAINTENANCE REQUIREMENTS, AND RESPONSIBILITY

CHAPTER 8 FIRE HYDRANTS AND FIRE PROTECTION WATER MAINS STANDPIPES, AND FIRE PUMPS

Ref: (a) NAVFAC MO-117, Maintenance of Fire Protection Systems
(b) NFPA 25, Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems

1. Purpose. This chapter provides the requirements and responsibilities for the operation, inspection, testing, and maintenance of fire protection hydrants, fire protection water mains, standpipes, and fire pumps.

2. Policy

a. Hydrants and Fire Protection Water Mains

(1) General Requirements

(a) No person shall use or operate any hydrant or other valves installed on any water system intended for the use by the Fire Division without the authorization of the Fire Division.

* (b) The placement of equipment, lay down, or any item that restrict or unreasonably delays the utilization of fire hydrants is prohibited. Clearance around all fire hydrants shall be a minimum of 7 feet with this width maintained to the street.

(c) The Fire Division shall be notified when fire hydrants are taken out of service. A blue herculite bag covering the hydrant will be used to identify hydrants that are out of service.

(2) Inspection, Testing, and Maintenance Requirements of Hydrants and Fire Protection Water Mains shall be in accordance with reference (a) and exhibit III-8-1 of this manual. Facilities and Maintenance Department will be responsible for the maintenance and repair of all fire hydrants, sectional valve, foot valves and all other components of the Shipyard fresh and saltwater fire protection distribution systems.

b. Class I, Dry-Pipe Standpipe Systems

(1) Class I, Dry-Pipe Standpipe Systems are standpipes in which there is no permanent water supply. Water must be supplied by the Fire Division. It provides 2½-inch hose connections designed for use by the Fire Division.

(2) Inspection, Testing, and Maintenance Requirements of Class I, Dry-Pipe Standpipe Systems shall be in accordance with reference (a) and exhibit III-8-2 of this manual.

c. Fire Pumps

(1) Fire pump units shall be maintained in constant readiness. The pump must be able to start at a moment's notice, and be able to run for a long period of time. To ensure that these conditions are met, frequent testing is mandatory.

(2) Inspection, Testing and Maintenance Requirements of Fire Pumps shall be in accordance with references (a), (b), and exhibit III-8-3 of this manual.

EXHIBIT III-8-1
SUMMARY OF FIRE HYDRANT AND FIRE PROTECTION WATER MAIN INSPECTION, TESTING, AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
FIRE HYDRANTS			
Identify Fresh Water Hydrants	As Required	910	Paint potable fire protection water sources yellow. Identify each hydrant to correspond to the assigned number of the Shipyard water distribution map, with the number stenciled directly on the hydrant. The size of the fire main will be stenciled at the base of the hydrant barrel. Provide reflective blue road markers in road adjacent to hydrants to facilitate locating.
Saltwater Mains	As Required	910	Perform maintenance, as required, to maintain saltwater fire protection mains. Paint saltwater fire-protection mains red.
Hydrant Nozzles	Annual	1124	Check tightness of nozzles at the point where nozzles enter hydrant barrel.
Hydrant Bonnet	Annual	1124	Check for leaks in top of hydrant.
Hydrant Gaskets	Annual	1124	Check for leaks pass gaskets, under caps.
Hydrant Barrel	Annual	1124	Check for cracks in barrel.
Hydrant Valve Seat and Drain	Annual	1124	Check tightness of valve, seat and drain. Watch for lowering of the water level after the valve has been closed. If the level does not drop, listen. If a noise is heard, the hydrant valve is probably leaking. If no noise is heard, the drain valve is plugged.

EXHIBIT III-8-1
SUMMARY OF FIRE HYDRANT AND FIRE PROTECTION WATER MAIN INSPECTION, TESTING, AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Hydrant Operating Nut	Annual	1124	Inspect operating nut for worn or rounded condition.
Hydrant Nozzle Threads	Annual	1124	Inspect nozzle threads by making and breaking connections on all discharge ports.
Flow Hydrant	Annual	1124	Operate hydrant to determine if water supply is open.
FIRE PROTECTION WATER MAINS			
Water Mains	Annual	910	Annual fire flow tests shall be conducted to determine the condition of water mains. Compare the results of the water flow test with previous tests to determine if there has been a deterioration. Investigate large drops in the water supply detected. Flush water mains during a capacity test by allowing the flowing hydrant to remain open until the water flows clear.

Enclosure (1)

EXHIBIT III-8-2
SUMMARY OF DRY-PIPE STANDPIPE INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
CLASS I DRY-PIPE STANDPIPE SYSTEMS			
Valves	Monthly	1124	Check valves to make sure that they are not damaged and are readily accessible.
F.D. Conn.	Monthly	1124	Inspect Fire Department connections to make sure they are readily accessible, the inlets are unobstructed, and the protective caps are in place.
Piping	Annual	910	Inspect piping of dry-pipe systems for damage or corrosion.
System	5 Year	910	Hydrostatically test dry-pipe standpipe systems. Test shall be conducted at 200 psi. for two hours.

EXHIBIT III-8-3
SUMMARY OF FIRE PUMP INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS, AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
FIRE PUMPS			
Fire Pump Operating Test	Weekly Monthly	910	Conduct fire pump operating test; engine driver fire pumps test weekly; electric-driven fire pumps test monthly. Allow units to run at full speed while discharging water through an outlet. Automatically start the pump by dropping system pressure. Inspect temperature and tightness of packing glands. Check and record the reading of the suction and discharge pressure gauges. Check controller lights to determine unit is in "automatic" operation. Ensure all valves in the supply and discharge piping are in the open position.
Internal Combustion Engine Drivers	Weekly	910	Ensure engine is clean and dry. check fuel supply tank and maintain at least an 8-hour fuel supply. Check quality and quantity of crankcase oil and renew it if it becomes foul or loses viscosity. Examine oil filter and replace as necessary. Verify that the battery charger is operating correctly and check the condition of the battery electrolyte. Run engine for at least 30 minutes.
Internal Combustion Engine Drivers	Annual	910	Conduct annual maintenance in accordance with manufacturer's recommendations. If not available, in accordance with reference (b).

EXHIBIT III-8-3
SUMMARY OF FIRE PUMP INSPECTION, TESTING, AND MAINTENANCE REQUIREMENTS AND RESPONSIBILITIES

ITEM	FREQ	ASSIGN	PROCEDURE
Pump	Annual	910	Conduct annual fire pump performance test to determine the condition of the pump by full operating test which discharges water from the pump at various flow rates.

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Volume IV - GENERAL FIRE PREVENTION REGULATIONS

CHAPTER 1 - FIRE PREVENTION INSPECTIONS, EVACUATION DRILLS, FIRE BILLS, AND BUILDING EVACUATION PLANS

Ref: (a) NAVFAC P-1021, Navy Shore Establishment Fire Protection/Prevention Program
(b) Title 29 Code of Federal Regulations (CFR) 1910.38

1. Purpose. The purpose of this chapter is to provide policy and responsibilities regarding building fire prevention inspections, fire prevention inspection deficiencies, building fire drills, building evacuation plans, and employee emergency action plans.

2. Policy

a. Building and Facility Fire Prevention Inspections

(1) The purpose of building and facility fire inspections is to assist Department/Office Heads in discharging their responsibility for fire prevention in buildings and facilities assigned.

(2) Responsibility

(a) Department/Office Heads

1. Abate, through corrective action approved by the Fire Division, all conditions identified or causing the building/facility to be unsafe either by repair, rehabilitation, or other corrective action approved by the Fire Division.

2. All buildings, sheds, rooms, etc., must be inspected by the Fire Division on a regular basis. To facilitate access to these otherwise secured spaces, Department/Office Heads shall ensure that doors to secure buildings, sheds, and rooms are provided with a sign identifying the code maintaining custody and telephone number of the point of contact.

(b) Fire Division (Code 1124)

1. Conduct Fire Prevention Inspections at a frequency commensurate with the hazard. However, the following minimum inspection frequency shall be maintained in accordance with reference (a):

a. Weekly. Extra-hazardous occupancy facilities or areas where the fire loading and ongoing activity present a high risk to life, safety, and severe fire potential.

b. Monthly. Industrial, maintenance, transportation, ship building facilities, recreation, flammable gas and liquids storage facilities, day-care centers, automated data processing and communication equipment facilities, commissaries, and retail stores.

c. Quarterly. Dormitories, common areas of multifamily housing, office occupancies, adult schools, low-hazard storage facilities, and all other structures of low risk, except family housing.

d. Annually. Family housing units of East Park and Shipyard Officer's Housing.

2. Conduct NAVOSH Inspections. Conduct annual NAVOSH inspections of all buildings and facilities in conjunction with Code 106.

b. Building and Facility Fire Prevention Inspection Deficiencies

(1) The purpose of the Fire Prevention Inspection Deficiency Program is to identify to Department/Office Heads conditions that represent a potential hazard to the fire and life safety of personnel and assigned buildings. The Fire Prevention Inspection Tracking Program monitors the status of deficient conditions until corrected. Once corrected, the deficiency becomes part of the building inspection history.

(2) Responsibility

(a) Department/Office Heads

1. Initiate immediate corrective action in accordance with paragraph 2a(1)(a)1 through the designated Department Fire Warden.

2. Report corrective actions taken to address deficient conditions to the Fire Division by the date specified.

3. Request extensions for deficient conditions that cannot be immediately corrected.

(b) Fire Division (Code 1124)

1. Identify deficient conditions to the designated Department Fire Warden on Fire Inspection and Action Report, PSNS 11320/35 (Rev. 4-93).

2. Identify deficient conditions noted during annual NAVOSH inspections to Code 106 for incorporation into the NAVOSH Abatement Program on Fire Department NAVOSH Fire Inspection Report, PSNS 11320/47 (Rev. 4-93).

3. Issue extensions for deficient conditions that cannot be immediately corrected based on the potential and severity of the deficient condition.

4. Publish a listing of pending deficient conditions for quarterly senior management review.

(c) Facilities and Maintenance Officer (Code 910). Assign priority to Work Request (Maintenance Management, NAVFAC 9-11014/20 (Rev. 2-68), and Emergency/Service Work, PSNS 11320/21 (Rev. 11-83) identifying deficient conditions affecting fire and life safety.

c. Building Fire Drills

(1) Fire drills shall be conducted in all buildings annually where three or more personnel are employed per shift. Areas where less than three personnel per shift are employed shall conduct training to ensure that personnel are aware of the means of escape and how to report a fire.

(2) All personnel in buildings where drills are conducted shall participate with the exception of those mission essential personnel with prior approval of the Fire Division.

(3) Family residences are excluded, but are encouraged to provide for exit drills and planning in the home.

(4) Responsibility

(a) Building Fire Warden

1. In areas not equipped with evacuation alarms, or where three or less persons are employed per shift, it shall be the responsibility of the Building Fire Warden to schedule and conduct at least one fire and evacuation drill annually.

2. Take corrective actions for deficient conditions identified during fire drills.

(b) Fire Division (Code 1124)

1. Schedule and conduct drills annually in buildings equipped with fire evacuation alarms.

2. Schedule evacuation drills one month in advance so as to minimize disruption of Production and coordinate with the Department Fire Warden.

3. Provide a record of all drills held and make recommendations to Department Fire Wardens regarding evacuation procedure improvements.

d. Building Evacuation Plans

(1) In accordance with reference (b) Building Evacuation Plans, PSNS 11320/64 (7-93) are required for all buildings that are occupied by 10 or more employees.

(2) The Building Evacuation Plan shall identify by floor all exits, emergency escape routes, and the designated assembly area. (See Exhibit IV-1-1)

(3) The Building Evacuation Plan shall identify the location of all physically impaired personnel requiring additional assistance to evacuate.

(4) Responsibility

(a) Departments Fire Warden

1. Develop and maintain Building Evacuation Plan(s) for all buildings under the Department/Office Heads cognizance.

2. Post Building Evacuation Plans conspicuously (i.e. along normal routes of travel, bulletin boards, etc).

3. Building Evacuation Plans shall be approved by the Department Fire Warden and the Fire Chief.

(b) Fire Division (Code 1124). Assist Building Fire Wardens in developing and maintaining Building Evacuation Plans.

e. Employee Emergency Action Plans

(1) Shall be developed and maintained in all buildings that are occupied by 10 or more employees.

(2) Shall cover those designated actions that must be taken to ensure employee safety from fire and other emergencies, to include the means for reporting fires and other emergencies, evacuation procedures for all personnel, including physically impaired personnel requiring additional assistance, and procedures to account for all employees after emergency evacuation has been completed.

(3) Personnel assigned responsibility, and their alternates, to assist physically impaired personnel to evacuate shall be listed.

(4) Shall be in writing utilizing the Supplementary Fire Bill, PSNS 11320/18 (4-88), and the Fire Bill, PSNS SECO OP #1 (4-88).

(5) Shall be reviewed with employees initially when the plan is developed and whenever employees' responsibilities or designated actions change.

(6) In buildings with fewer than 10 employees, the employee emergency action plan shall be communicated orally to employees.

(7) Responsibility

(a) Departments Fire Warden

1. Develop and maintain Supplementary Fire Bill, PSNS 11320/18 (4-88), and Fire Bill, PSNS SECO OP #1 (4-88), for all buildings under the Department/Office Heads cognizance.

2. Post conspicuously (i.e., along normal routes of travel, bulletin boards, etc).

3. Supplementary Fire Bill shall be approved by the Department Fire Warden and the Fire Chief.

(b) Fire Division (Code 1124). Assist Building Fire Wardens in developing and maintaining employee emergency action plans.

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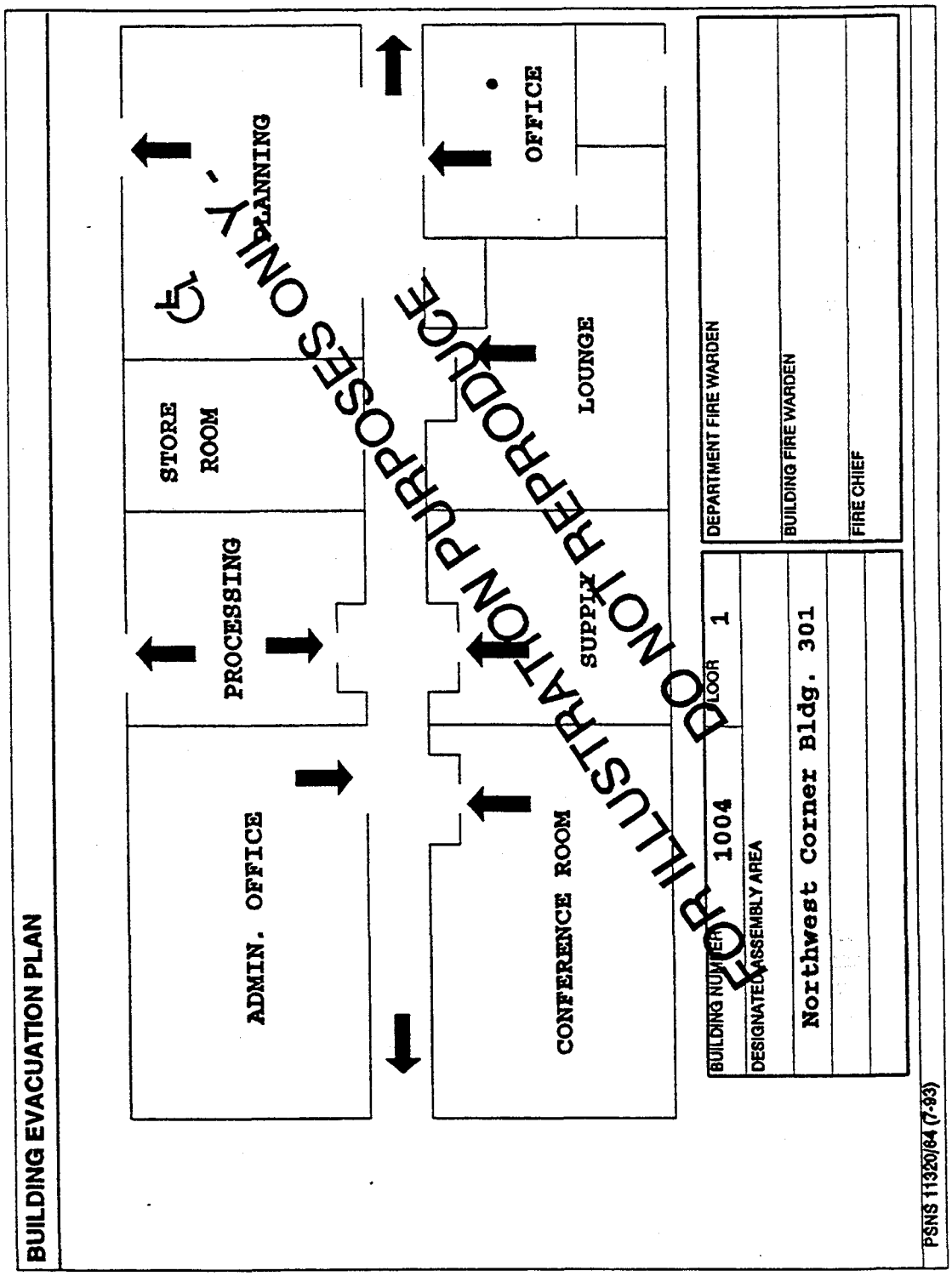

EXHIBIT IV-1-1
SAMPLE BUILDING EVACUATION PLAN

Enclosure (1)

VOLUME IV - GENERAL FIRE PREVENTION REGULATIONS

CHAPTER 2 COMMON BUILDING FIRE HAZARDS

Ref: (a) NAVSHIPYDPUGETINST 5090.5A, Hazardous Waste Management Plan (HWMP)
(b) National Fire Protection Association (NFPA) 701, Standard Methods of Fire Tests for Flame-Resistant Textiles and Films

1. Purpose. This chapter identifies common building fire hazards and regulations.

2. Policy

a. General. Any condition, which by its existence, creates a threat of life or property from fire or explosion, shall be corrected and rendered safe or removed.

b. Housekeeping. Good housekeeping is basic to fire safety and shall be a major concern in all buildings and facilities. All employees shall accept the responsibility for housekeeping in their respective area.

(1) Disposal of Waste Materials

(a) The proper handling and disposal of waste materials is an indispensable part of the Shipyard's Good Housekeeping Program. Its success depends upon having and observing a satisfactory routine.

(b) The proper and regular disposal of wastepaper, rubbish, and other combustible material is essential. At a minimum, at the end of each working day, waste material shall be removed from all areas and deposited in metal, lidded, refuse dumpsters. Waste recycling and accumulation of NOFORN materials are permitted provided: materials are picked up on a regular basis; the quantity of materials do not represent a hazard to fire or life safety; and the quantity does not significantly contribute to the facility's fire load.

1. Work areas shall be kept free of accumulations of combustible debris.

2. Discarded wood and combustible packing debris shall be removed from the building immediately after uncrating.

Enclosure (1)

(c) Waste Receptacles

1. Open-top waste baskets shall be of metal or other noncombustible material. Plastic, cardboard, or other combustible trash containers shall not be used.

2. Larger waste receptacles shall be made of metal and equipped with fitted covers.

(d) The disposal of materials identified as hazardous waste shall be in accordance with reference (a).

(2) Storage of Highly Combustible Material Awaiting Use

(a) Noncombustible containers with covers shall be provided and used for storing supplies of clean rags, packing materials, such as excelsior and shredded paper, and other similar combustible materials in current use.

(b) Highly combustible materials awaiting use, containing flammable and combustible liquids, i.e., chemically soaked rags, etc., and materials subject to spontaneous ignition, shall be stored in plainly marked, self-closing approved containers.

(3) Prohibited Areas of Combustible Storage

(a) Storage of combustible materials is prohibited in equipment rooms, boiler rooms, exit corridors, in stairway enclosures, or under stairs, and in attic spaces which are not protected by automatic sprinkler systems.

(b) Combustible materials shall not be placed on radiators, heaters, or steam pipes.

(4) Attics and Concealed Spaces

(a) Attics and concealed spaces shall be kept clean. Attics not protected by an automatic sprinkler system shall not be used for storage of combustible materials.

(b) Scuttle holes and other openings communicating to attics or concealed spaces shall be fitted with doors equivalent in fire-resistance to ceiling construction, and shall be kept closed.

c. Cleaning Agents. The availability of nonhazardous cleaning agents make unnecessary the use of low-flash point, unstable, and/or toxic materials for cleaning. These relatively safer materials are stable and have high-flash points ranging from 140° to 190° F., and have a comparatively low degree of toxicity. The use of low flash point cleaning agents is prohibited.

d. Floor Cleaning and Maintenance

(1) The general care, treatment, cleaning, and refinishing of floors may present a fire hazard if flammable or combustible solvents or finishes are used. Flammable and combustible liquids shall not be used for cleaning floors.

(2) Only noncombustible sweeping compounds and absorbent materials shall be used for sweeping floors and absorbing oily materials.

(3) Low-flash point floor waxes are hazardous, especially when applied with electric floor polishers. Only water emulsion-type floor waxes shall be used.

e. Spontaneous Heating and Ignition. Heating and ignition involving a combustible material, or a combination of materials, are considered spontaneous if the material itself can cause an exothermic (heat-producing) chemical action without exposure to external fire, spark, or abnormal heat. In some cases, lack of ventilation, improper storage temperatures, and moisture presence in some materials can cause chemical reactions in storage. Cleaning gear, i.e., mops, oil-soaked cloths, and other gear used with materials subject to spontaneous ignition, shall be kept outside of buildings or in separate metal lockers properly ventilated.

f. Furnishings, Decorations, and Treated Finishes

(1) General

(a) The use of open-flame lighting devices, such as candles and oil lamps, shall be prohibited except in family housing, and by permit for ceremonial purposes and use in clubs/dining facilities.

(b) Decorations, furnishings, or other objects shall not be placed so as to obstruct access to, egress from, or visibility of exits.

(c) Textile materials having a napped, tufted, looped, woven, nonwoven, or similar surface shall not be applied to walls or ceilings. Previously approved, existing, Class A installations shall be permitted.

(d) Interior wall and ceiling finish not in excess of 10% of the aggregate wall and ceiling areas of any room or space shall be permitted to be Class C where interior wall and ceiling finish is required to be Class A or Class B.

(e) Christmas Trees and Decorations. Department Heads may authorize Christmas trees and decorations in shops and offices subject to the safeguards listed below.

1. Trees should be limited in size as much as practical.

2. Natural cut Christmas trees may be set up after the tenth of December and must be removed from shops and codes by the close of work prior to the holiday closure.

a. Shall not be permitted in assembly, health care, mercantile, or bachelor enlisted or officer quarters unless the tree is located in an area protected by an automatic sprinkler system.

b. The bottom end of the tree trunk shall be cut off at an angle at least 1 to 2 inches above the end to help the tree absorb water. The tree shall be placed in a suitable stand with adequate water. The water level shall be checked and maintained on a daily basis. The tree shall be removed from the building immediately upon evidence of dryness.

3. Decorations and Christmas trees shall not be placed near electric light fixtures, sprinkler pipes, ventilators, radiators, or steam pipes, or other heating devices that could cause the tree to dry out prematurely or to be ignited.

4. In consonance with the Energy Conservation Program, decorative Christmas lights will not be permitted in shops and offices.

5. Trees shall not be placed near exits, main aisles, or busy passageways.

6. Artificial Christmas trees shall be labeled or otherwise identified or certified by the manufacturer as being "flame-retardant" or "flame-resistive."

7. Evergreen boughs and other foliage are not to be used for decorations unless placed in water.

8. No flammable decorations shall be permitted. All refuse such as tissue wrappings, etc., shall be removed from the vicinity of the Christmas tree.

(2) Assembly Occupancies

(a) Open-flame or pyrotechnic devices shall not be permitted.

(b) Draperies, curtains, and other similar loosely hanging furnishings and decorations shall be flame resistant as defined by reference (b).

(c) The Fire Division shall impose controls on the amount and arrangement of combustible contents to provide an adequate level of safety to life from fire.

(3) Health Care Occupancies

(a) Draperies, curtains, including cubicle curtains, and other loosely hanging fabrics and films serving as furnishings or decorations shall be flame-resistant in accordance with reference (b).

(b) Newly introduced upholstered furniture within nonsprinklered facilities shall meet the requirements for Class I as defined by NFPA 260, Standard Methods of Tests and Classification System for Cigarette Ignition resistance of Components of Upholstered Furniture.

(c) Newly introduced mattresses within nonsprinklered facilities shall have a char length not exceeding 2 inches when tested in accordance with Part 1632 of the Code of Federal Regulations 16.

(4) BEQ and BOQ Dormitory Occupancies. New draperies, curtains, and other similar loosely hanging furnishings and decorations shall be flame-resistant in accordance with reference (b).

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CHAPTER 3 LIFE SAFETY IN BUILDINGS AND STRUCTURES

Ref: (a) National Fire Protection Association (NFPA) 101, Life Safety Code
(b) OSHA 29 CFR 1910.35, Means of Egress

1. Purpose. This chapter provides general guidelines and regulations regarding life safety and egress of personnel from buildings and structures in cases of fire or other emergencies.

2. Policy

a. When in fixed locations and occupied as buildings, vehicles, vessels, and other mobile structures shall be treated as buildings and comply with the requirements of references (a) and (b).

b. Egress Design

(1) Every building or structure designed for human occupancy shall be provided with exits sufficient to permit the prompt escape of occupants in case of fire or other emergency.

(a) Every building or structure shall be provided with exits of kinds, numbers, locations, and capacities appropriate to the individual building or structure, with due regard to the character of the occupancy, the number of persons exposed, the fire protection available, and the height and type of construction of the building or structure.

(b) Two means of egress, as a minimum, shall be provided in every building or structure, section, or area where the size, occupancy, and arrangement endangers occupants attempting to use a single means of egress that is blocked by fire or smoke. The two means of egress shall be arranged to minimize the possibility that both may be impassable by the same fire or emergency condition.

(2) In every building, exits shall be so arranged and maintained as to provide free and unobstructed egress from all parts of the building at all times when it is occupied. No lock or fastening devices shall be installed to prevent free escape from the building.

(a) A latch or other fastening device shall be provided with a knob, handle, panic bar, or other simple type of releasing device having an obvious method of operation under all lighting conditions. Doors shall be openable with no more than one releasing operation.

(b) Where classified operations and other security concerns may require greater physical security, other provisions shall be considered provided that they do not impede with exiting of personnel during fires or other emergencies.

(c) Special locking mechanisms such as electrically controlled locks, elimination of hardware on the door exterior, installation of an electrically powered annunciator to indicate operation of individual doors, placarding doors intended for use as emergency exits, and special locking provisions permitted by reference (a) are acceptable methods to address increased security needs without placing life safety in jeopardy.

(3) Every exit shall be clearly visible, or the route to reach it shall be conspicuously indicated in such a manner that every occupant will readily know the direction of escape from any point.

(a) Signs will be provided to indicate the direction of travel to exits where the exits are not visible from any part of the floor area.

(b) Any doorway or passageway that is not an exit or a way to reach an exit, but is capable of being confused with an exit, shall be so arranged or marked to prevent occupant confusion with acceptable exits.

(c) Where artificial illumination is required in a building, exit facilities shall be maintained lighted at all times.

(4) Every vertical way of exit and other vertical opening between floors of a building shall be suitably enclosed or protected, as necessary, to afford reasonable safety to occupants while using exits, and to prevent spread of fire, smoke, or fumes through vertical openings from floor to floor before occupants have entered exits.

c. Egress Maintenance

(1) Every building or structure shall be arranged, equipped, maintained, and operated as to avoid undue danger to the lives and safety of its occupants from fire, smoke, fumes, or resulting panic during the period of time reasonably necessary for escape from the building or structure in case of fire or other emergency.

(a) Obstructions, including storage, shall not be placed in the required width of an exit. Exits shall not be obstructed in any manner and shall remain free of any material or matter where its presence would obstruct or render the exit hazardous. Stairways shall not be used for storage of combustible materials.

(b) No furnishings, decorations, or other objects shall be placed as to obstruct exits, access to exits, egress, or visibility of.

(c) Exit doors will not be locked while a building is occupied.

(d) Doors designed to normally be kept closed in a means of egress, such as a door to a stair enclosure, shall not at any time be secured in the open position.

(2) Alteration of any component of the exit design to include the elimination of exit doors, changing of exit width of aisles and corridors, or which increases required travel distance to an exit shall not be permitted without the written authorization of the Fire Division.

d. Fire Protection, Alarm Systems, and Equipment. Every required sprinkler system, fire detection and alarm system, exit lighting, fire door, and other equipment required for life and fire safety shall be continuously maintained in proper operating condition. Any equipment requiring tests or periodic operation shall be tested and operated as specified by this manual and other applicable codes.

e. Temporary Occupancies. In those cases where buildings are used for the temporary housing or berthing of personnel, the safety of such personnel shall be of prime importance.

(1) Adequate means of egress shall be provided in accordance with reference (a).

(2) In the absence of a fire evacuation system, a standing watch may be required to alert personnel in case of an emergency.

f. Places of Assembly

(1) All rooms having an occupant load of 50 or more where fixed seats are not installed, and which is used for classroom, assembly, or similar purpose, shall have the capacity of the room posted in a conspicuous place near the main exit of the room.

(a) No person shall permit overcrowding or admittance of any person beyond the approved capacity of any place of public assembly.

(b) The Fire Division has the authority to suspend activities upon finding any overcrowding conditions or obstruction in aisles, passageways, or other means of egress, or upon finding any condition which constitutes a serious threat to life safety.

(2) The Fire Division shall be notified prior to all special events and activities which will involve large audiences. Where fixed seating is not provided, a seating plan will be submitted for approval and concurrence with reference (a).

(3) Prior to all activities in assembly occupancies where the occupant load exceeds 50 persons, an announcement shall be made to notify personnel of the locations of the exits to be used in case of a fire or other emergency.

g. Fire Safety Requirements for Clubs, Recreational, and Other Assembly Facilities. The following requirements apply to the operation of all clubs and recreation facilities. Club managers shall ensure that these requirements are incorporated into the facilities operating procedures. Facility operating procedures shall be submitted by club management annually for Fire Division review.

(1) General

(a) Clubs, recreation facilities, and dining establishments shall be under the constant supervision of a competent person during the time that the premises are open to the public.

(b) An approved method of notifying the Fire Division in the event of an emergency shall be provided and readily available to the public.

(2) Pre-Opening Inspection. Prior to opening to the public, Club/Facility Managers shall conduct a pre-opening inspection of the facility to ensure:

(a) All components in the means of egress including aisles, exit doors, and exit discharges are clear and accessible.

(b) Exit signs and emergency lights are operable.

(c) Access to fire alarms and portable fire extinguishers are clear.

(d) Fixed fire protection and alarm systems are operational and unimpaired.

(e) No hazards exist which may jeopardize the life safety of the public.

(3) Conditions to be Monitored During Operation. During times that the facility is open to the public, the Club/Facility Managers shall be responsible to ensure that:

(a) Overcrowding and admittance of persons beyond the approved capacity of the facility are not permitted.

(b) The means of egress is not used in anyway that will obstruct its use.

(c) Operation of the facility or introduction into the facility of activities or materials does not result in a threat to life safety.

(4) Facility Closing Inspection. On completion of each business day, managers of clubs, hobby shops, recreation buildings, etc., will ensure the following tasks are performed:

(a) Determine that the contents of all trash containers, ash trays, and other receptacles have been disposed of in a safe manner outside of the building.

(b) Inspect all sofa and chair cushions for smoldering cigarettes.

(c) Secure all gas and electric appliances except those designated for continuous operations (refrigerator, clock, water cooler, etc.) are turned off and unplugged.

(5) Enforcement. The Fire Division shall make random inspections of clubs, gymnasiums, dining facilities, etc., during operating hours to determine if operations, egress, and other life safety regulations are being enforced.

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CHAPTER 4 SMOKING

1. Purpose. This chapter identifies areas where smoking is prohibited and provides general guidelines and regulations to control smoking as a source of ignition.

2. Scope. This chapter regulates smoking only as a source of ignition which could cause a fire or explosion. The Fire Division does not regulate smoking on the basis of health, air quality, or other related issues.

3. Policy

a. Fire Division Authority. Where conditions are such as to make smoking a hazard in any area, the Fire Division is authorized to require the area to be posted as a no smoking area.

b. No Smoking Signs shall be posted in all areas where smoking is prohibited. Signs shall be conspicuously and suitably located and shall be maintained. Smoking or depositing any lighted or smoldering substance in a place where required "No Smoking" signs are posted is prohibited.

c. Designated Smoking Areas may be established within prohibited areas with the approval of the Fire Division. Such areas shall be clearly defined and posted. An adequate number and properly designed receptacles for discarding smoking materials shall be provided. Contents of ash trays will be disposed of in a safe manner.

d. Improper Disposal of Smoking Materials. Lighted matches, cigarettes, cigars, or other burning objects shall not be discarded in a manner that could cause ignition of other combustible material.

e. Areas Where Smoking Shall be Prohibited. The following areas will be posted and maintained as no smoking areas:

(1) Shop areas (production, repair, maintenance, hobby, auto, paint)

(2) Storage rooms

(3) Warehouses

(4) Sales areas such as grocery and general merchandise areas

(5) Places of assembly such as theaters, gymnasiums, classrooms, and auditoriums

(6) Dormitory bunks

(7) Attics, lofts, roofs, and under structures

(8) Data processing facilities

(9) Secured or vacant structures

(10) Within 50 feet of any point where fuel is being transferred.

(11) Flammable and combustible liquid and gas-handling and dispensing areas

(12) Areas containing dust-producing or dust-agitating operations

(13) Where paint and plastic coatings are being applied

(14) Inside radioactive material storage areas

(15) Shipping and receiving areas

(16) Where open flames or spark-producing equipment are prohibited

(17) Where no smoking signs are posted

(18) Where the Shipyard has determined that a hazard exists

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CHAPTER 5 BUILDING CONSTRUCTION AND ALTERATION

Ref: (a) MIL-HDBK 1008A, Fire Protection For Facilities Engineering, Design, and Construction

* 1. Introduction. Buildings and other structures are more vulnerable to fire when they are under construction, alteration, demolition, or vacant. This is because when fires do occur they are likely to spread more rapidly due to the absence or impairment of fire protection and detection systems, the lack of compartmentation, the presence of heavier concentrations of combustibles, and the fact that fires are not often discovered in their earliest stage.

1. Purpose. The purpose of this chapter is to provide information and regulations regarding new construction, rehabilitation, and alteration of existing structures so as to provide for adequate fire prevention and protection during this more vulnerable period of a building's history.

2. Scope. The scope of this chapter includes all phases of construction and remodeling of buildings and facilities in the Shipyard. The scope of this chapter also recognizes that under some contracts, the contractor has primary responsibility for the protection of their own work to include injury to persons, or to other property that occurs as a result of their fault or negligence in connection with the execution of their work. It is the intent of this chapter to regulate, to the minimum, those reasonable requirements of fire prevention to assure access, good housekeeping, and to protect other Shipyard property.

3. Policy

a. Planning. Fire protection criteria shall conform to the requirements of reference (a), and of the applicable standards contained in the current National Fire Codes, published by the National Fire Protection Association (NFPA), the Office of Safety and Health Administration (OSHA), and the Uniform Building Code (UBC), except as modified by reference (a).

b. Plan Review Responsibilities

(1) Applicant

(a) All new construction/alterations/facility improvement projects, including Self Help projects, shall be submitted to Facilities and Maintenance Department (Code 910).

(b) It is the responsibility of the applicant to

Enclosure (1)

ensure:

1. That the construction documents include all of the fire protection requirements.

2. That the shop drawings are correct and in compliance with the applicable codes and standards.

3. Review and approval shall not relieve the applicant of the responsibility of compliance with the applicable codes and standards.

(2) Facilities and Maintenance Officer (Code 910). Forward plans to the Fire Division that affect fire and life safety compliance.

(3) Fire Division (Code 1124). Review documents and shop drawings for the purpose of acceptance or provide reasons for nonacceptance within established time frames.

c. Plan Review by Fire Protection Engineer

(1) Plans for major alterations, new construction, installation of fire alarm and fire protection systems shall also be submitted to Western Division, Naval Facilities Engineering Command, for review.

(2) Fixed fire protection systems installed or modified shall be subjected to an acceptance test conducted under the cognizance of the Engineering Field Division Fire Protection Engineer.

d. Occupancy Classification Changes. When buildings are renovated for a use other than that for which they were originally built, new operating hazards may be introduced that shall require provisions of additional protective measures which shall conform to codes applicable to the new intended occupancy.

e. Rehabilitation of Buildings. When alterations and renovations are planned for existing buildings and structures, it shall be the occasion to re-examine the fire protection features, correct deficiencies, and provide such additional measures as required by code. The following construction features are important to the building's fire protection.

(1) Vertical Openings. The enclosure of vertical openings is most important in preventing the vertical spread of fire. It is the largest factor in connection with life and property safety in multistory buildings.

(2) Horizontal Openings. Wall openings shall be protected Enclosure (1)

to prevent the horizontal spread of fire. This is intended to limit and confine the fire to as small an area as possible.

(3) Concealed Spaces. Any draft stop helps to slow the spread of fire and helps in fire suppression.

(4) Combustible Construction. Very rapid flame spread on the surface of certain interior finishes widely used in the past shall be replaced by an approved method of noncombustible interior finish materials.

(a) Interior finish contributes to fire impact in four ways:

1. It affects the rate of fire buildup to a flashover condition.

2. It may contribute to fire extension through flame spread over its surface.

3. It may add to the intensity of the fire by contributing additional fuel.

4. It may produce smoke and toxic gases that can contribute to life hazard and property damage.

(b) The installation of plywood and other combustible materials during new construction or renovation is strictly forbidden by reference (a).

(c) Existing combustible interior finishes represent a hazard to life and property. The following safeguards shall be taken:

1. Cover combustible surfaces with gypsum board or other materials meeting the requirements of reference (a).

2. Protect the building with an automatic sprinkler system.

f. Occupancy of Buildings During Construction, Repair, or Alteration. Buildings or portions of buildings shall not be occupied during construction, repair, or alteration without the approval of the Fire Division if required means of egress are impaired or required fire protection systems are out of service.

g. New Construction. The Officer-in-Charge of Construction and Resident Officer-in-Charge of Construction shall establish liaison with the Fire Division and all parties, including the contractor, to achieve the maximum in fire prevention and fire protection within the limit of the contractor's responsibility to the government.

* h.

General Fire Prevention/Protection Measures At Building Construction/Alteration Sites and Vacant Buildings

(1) Fire Department access for the purpose of fire fighting shall be established and maintained throughout the construction project. Construction material shall not block access to the building, hydrants, or other fire appliances.

(2) Combustible debris shall not be accumulated within any building. Combustible debris, rubbish, and waste materials shall be removed from the building as often as practical.

(3) Water mains and fire hydrants shall be operational as soon as practical.

(4) The Fire Division shall designate the number and type of fire extinguishers to be provided for all buildings under construction or alteration.

(5) Temporary heating devices shall be of the approved type, operated, attended, and maintained in the approved manner, and located away from combustible materials.

(6) Smoking shall be prohibited, except in those areas approved by the Fire Division.

(7) The storage, handling, and use of flammable and combustible liquids shall be in accordance with Volume 5, Chapter 1, of this manual.

(8) Asphalt kettles shall not be used inside of or on the roof of any building.

(a) Kettles, while in operation shall be placed a safe distance from any combustible materials or buildings, and shall be attended at all times while the burner flame is on.

(b) There shall be at least one approved fire extinguisher with a minimum Underwriters Laboratory (UL) rating of 20B within 30 feet of the kettle and one additional 20B extinguisher on the roof being covered.

(9) During alterations of existing buildings protected by fire protection systems, such systems shall be maintained operational at all times during the alteration.

(a) When alteration requires modification of a portion of a system, the remainder of the system shall be kept in service.

(b) When it is necessary to shut down the entire system, a fire watch shall be kept on site until the system is returned to service.

(10) Prior to the commencement of any work on fixed fire protection systems, the Fire Division and Facilities and Maintenance Department Alarm Technicians shall be notified. Facilities and Maintenance Department Alarm Technicians shall be responsible for the securing and reactivation of the system. No other personnel are authorized to disable fixed fire protection systems.

(11) Only qualified personnel, such as licensed fire protection systems contractors or fire protection systems maintenance personnel, are authorized to modify or install fixed fire protection systems.

* (12) All Contract Representatives shall notify the Fire Department of all work that may affect any fire alarm or fire protection system, (i.e., smoke detectors, sprinkler systems, and auxiliary pull stations). Work that requires reporting includes, but is not limited to, hot work next to sprinkler heads or any operation that creates dust in areas where smoke detectors are present. All smoke detectors shall be protected from dust and fumes to avoid affecting the sensitivity of the detectors.

(13) The use of fire hydrants is prohibited except as authorized by the Fire Division.

(14) Any anticipated utility outages; i.e., water, electrical, air, etc., shall be scheduled through the appropriate Utilities Department. The Fire Division shall be notified of the outage and when the utility is restored.

(15) The Fire Division shall be notified prior to the closure or blockage of streets, roads, and Fire Division access lanes.

(16) Hot work shall be approved by the Fire Division in accordance with Volume IV, Chapter 8, paragraph 1, of this manual.

(17) The storage of combustible building materials and supplies shall be maintained at a minimum of 25 feet from buildings.

(18) Prior to the commencement of work, all personnel shall become familiar with the emergency reporting procedures in the event of a fire or emergency.

(19) All fires, no matter how small, shall be reported to the Fire Division.

Enclosure (1)

(20) The use of straw hay bales or other highly combustible materials for erosion/environmental control is prohibited within the Controlled Industrial Area, or within 25 feet of any structure.

* (21) Personnel having control of any vacant building shall remove all combustible waste and refuse and lock, barricade, or otherwise secure all windows, doors, and other openings in the building to prohibit entry by unauthorized persons.

* (a) The Fire Department will be notified prior to a building or a portion of a building being vacated.

* (b) The shop or code having cognizance over moving out of a building or area will be responsible to leave the area in a fire safe condition. Prior to the release of responsibilities to an area, the Fire Department will be notified to inspect that area and concur that the area is left in a fire safe condition.

(c) Buildings that are vacant shall maintain all required sprinklers, standpipe systems, and alarm systems unless written approval to do otherwise is given by the Fire Chief.

* (d) For areas where a sprinkler system, standpipe system, or fire alarm system has been out of service for 30 days or more, the system shall be inspected and tested by Code 910 and witnessed by Code 1124 before it is restored to service.

i. Torch-Applied Roofing is a hazardous construction process. Extreme caution shall be used. All roofing operations involving heat sources and hot processes shall be conducted by qualified personnel under close supervision. The following procedures will be utilized when using any heat source to install or repair roofing systems.

(1) Pre-Authorization. Under no conditions shall work start without an inspection and a Hazardous Operation Permit, PSNS 11320/17 (Rev. 11-89), issued by the Fire Division.

(a) Personnel shall acquaint themselves with the location of the nearest fire alarm box that would need to be activated in the event of an emergency. If there is no fire alarm box immediately accessible, communications shall be present to permit contact with NESCOM in the event of an emergency.

(b) If at anytime during operations there is ignition of material or an extinguisher is required to be used, the Fire Division shall be notified without delay.

(2) Installation Safeguards. Torches used to secure roofing membranes shall be used in accordance with manufacturers'

recommendations. To prevent smoldering or ignition of membranes, they shall not be overheated. The exposed outer surface of the membrane shall be heated until a slight sheen develops. The flame from a hand-held torch shall be constantly moved from side to side. If a mobile heating apparatus is used, it shall be kept in constant motion while operating.

* (a) Caution shall be used when working around roof openings, penetrations, or flashings. Wood nailers, cant strips, and metal flashing shall not come in direct contact with the flame of the torch. Small torches shall be used to heat the underside of the membrane away from these areas before securing. Hot trowels shall be run along seams at laps and flashing to soften the adhesive. A torch shall not be used in areas where the flame impingement cannot be fully viewed.

* (b) Extreme caution shall be used near penetrations such as exhaust vents. Flames could ignite grease and lint accumulations. Such accumulations shall be cleaned and inspected before work is started. Air conditioning units and ventilation fans shall be shut down before torch work is done in surrounding areas. Roof openings/vents shall be covered with a noncombustible cover to prevent ignition of building contents. Expansion joints shall be filled with mineral wool or ceramic fiber with a steel cover plate below.

* (c) Open flames shall not be left unattended. A torch stand shall be used to direct the flame upward when momentarily not in use. Secure the cylinder valve to burn off propane gas in the line before shutting off the torch head. The gas supply shall be shut off whenever a propane odor is detected.

* (d) Torches shall not be used near gas lines, electrical wires, or flammable liquids.

* (e) The torch flame shall not be applied to a combustible substrate for the membrane. Base ply shall be used to cover wood deck, combustible insulations, small crevices, cant strips, plastic fastener plates, or any other combustible surface. Base ply shall be either glass fiber felts or minimum 40-lb organic felts.

* (3) <u>Equipment Safeguards</u>

* (a) Torches shall be equipped with a pilot adjustment, flame height adjustment, 25 to 50 feet of approved or listed hose, pressure gauge, and regulator. A spark igniter shall be used. Torch trolleys and multiple head machines shall be equipped with listed safety valves.

* (b) The fuel gas cylinder shall be adequately sized for

the torch used. If frost build-up occurs and the rate of vapor withdrawal is no longer adequate, the cylinder shall not be placed on its side or heated with the torch. The hose shall be disconnected and a larger cylinder used.

* (c) Safety caps shall be tied to all propane cylinders and installed on the valves whenever cylinders are not in use. Carts shall be used to transport propane cylinders. All cylinders shall be chained against a wall or in a cart. Fuel gas cylinders shall not be hoisted by their valves. Straps placed around the cylinders shall be utilized.

(d) There shall be at least one multipurpose 2-A:20-B:C portable fire extinguisher within 20 feet horizontal travel distance of torch-applied roofing.

* (4) Post-Inspection

(a) A fire watch shall be conducted for at least one
* hour after torches have been extinguished. The Fire Division shall be notified when the one-hour fire watch is underway. At the end of the one-hour fire watch an inspection will be performed with the contractor, the Fire Division, and the contract compliance staff.

* (b) The entire area where hot work was performed, including the interior, shall be inspected with a supplied thermal imager. Any areas showing excess heat or possible areas where combustion is taking place will be monitored and opened back up, if necessary to insure that there is no potential for fire or smoldering to occur in the roof system.

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CHAPTER 6 ELECTRICAL FIRE SAFETY

Ref: (a) National Fire Protection Association (NFPA) 70, National Electrical Code
(b) OSHA 29 CFR 1910.301-399

1. Purpose. This chapter identifies general electrical fire safety regulations and precautions.

2. Policy

a. General

(1) All electrical appliances, fixtures, and wiring shall be installed and maintained by qualified personnel in accordance with references (a) and (b). Electric devices shall be labeled or listed for the intended application.

(2) Defective electric cords, lighting fixtures, appliances, and switches shall be required to either be repaired or removed immediately. All defective electrical equipment shall be reported immediately and repaired by authorized electricians only. Electrical face plate covers, which are missing or damaged, shall be replaced.

b. Electric Motors shall be maintained in a manner free from accumulations of oil, dirt, waste, and other debris which may interfere with motor ventilation or create a fire hazard.

c. Extension Cords

(1) Extension cords shall not be used as a substitute for permanent wiring.

(2) Extension cords shall only be used with portable appliances while such appliances are in immediate use.

(3) Extension cords shall be plugged directly into an approved receptacle, power tap, or multiplug adapter and shall, except for approved multiplug extension cords, serve only one portable appliance. The amperage rating of the extension cord shall not be less than the rated capacity of the portable appliance.

(4) Extension cords shall be grounded when servicing grounded portable appliances.

(5) Extension cords shall not be affixed to structures, extend through walls, ceilings, floors, under doors or floor coverings, or be subject to environmental or physical damage.

(6) Extension cords shall be maintained in good condition without splices, deterioration, or damage.

d. Power Panels

(1) A clear and unobstructed means of access, with a minimum width of 36 inches, shall be maintained for access to power panels.

(2) Power panel doors shall be kept in the closed position at all times.

(3) The disconnecting means for each service, feeder, or branch circuit originating from a power panel shall be legibly and durably marked to indicate its purpose.

(4) No device shall be installed which will interfere with the normal operation of the circuit breaker or fuse.

e. Electrical Appliances. All electrical appliances will bear the affixed label and be listed by Underwriters Laboratories (UL), or equivalent.

(1) Coffee Makers, Microwave Ovens, and Similar Devices

(a) Units shall be located with adequate clearances from combustible materials and will not be operated in storage rooms, closets, lockers, or out-of-sight places.

(b) The installation of coffee makers and similar devices shall have clearances from combustible materials as follows:

1. Four inches at front, sides, rear, and base and eight inches at top.

2. A shield or enclosure shall be provided if the clearances from combustible materials cannot be met and the unit is not provided with thermal limiting controls.

3. Shields and enclosures are not necessary if units are equipped with thermal limiting controls and the clearance requirement from combustible materials are met.

(c) Extension cords are prohibited from supplying electrical service to personal size food preparation appliances.

(d) Automatic timers will not be used for coffee makers or other appliances used for heating food or beverage products.

(e) A Small Appliance Permit, PSNS 11320/20 (9-82), authorizing the installation and use of electrical coffee makers must be obtained from the Fire Division.

(2) All soldering irons, hot plates, coffee makers, and other nonfixed electrical heating devices shall be disconnected from outlets when not in use. Adequate clearance shall be maintained between all such electrical devices and combustible materials.

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CHAPTER 7 HEATING AND HEATING DEVICES

1. Purpose. This chapter identifies general heating fire safety regulations and precautions.

2. Policy

a. General

* (1) All heating equipment shall be of the approved type and installed, operated, and maintained in accordance with manufacturers' recommendations, to ensure maximum safety. Certain safety equipment is installed in heat producing equipment to control heat sources and to detect fuel leaks, e.g., a temperature limiting switch on a deep fat fryer. There may be other similar safety mechanisms for high temperature dip tanks, flame failure and flashback arrester devices on furnaces and similar heat producing equipment. If these devices are not properly maintained, or if they become inoperative, a definite fire hazard will exist. Operators of such equipment shall be aware of the specific type of safety control devices installed and shall assure, through periodic inspecting and testing, that these controls are operable.

(2) Adequate clearances will be maintained between combustible material and steam pipes, furnaces, flues, and attachments.

(3) Storage of combustibles in rooms designed for heating equipment is prohibited.

b. Portable Electric Heaters. The use of portable electric heaters is controlled by energy conservation policy. Where allowed, the following fire prevention regulations shall be enforced:

(1) The Fire Division shall have the authority to prohibit the use of portable heaters in occupancies or situations in which operation of the unit would present undue danger to life or property.

(2) Portable electric heaters shall be designed and located so that they cannot be easily overturned.

(3) Portable electric heaters shall be equipped to de-energize electric power to the unit when tilted or turned over.

(4) Adequate clearance from combustible materials, whether fixed, such as walls and structural members, or moveable, such as furniture, paper, clothing, or other materials, must be strictly maintained.

c. Portable Space Heaters Using Gas or Liquid Fuel are authorized by permit at construction sites or an interim emergency heating in facilities requiring protection from cold. Such appliances are prohibited in occupied structures, including family housing units.

d. Fireplaces in Family Housing Units and other approved locations will be maintained in good repair. Screen protection shall be provided. Facilities and Maintenance Department (Code 910) shall inspect and clean all fireplaces annually prior to operation.

e. Steam Pipes

(1) Steam pipes which come into contact with wood may cause fires. The steam pipe contact produces prophoric carbon which is subject to spontaneous ignition.

(2) All steam pipes shall be insulated so that there is no contact with combustible materials.

(3) Radiators and steam pipes shall not be used as racks for drying purposes.

(4) All steam pipes passing through floors, ceilings, or partitions of combustible materials shall be encased by a metal tube one inch larger in radius than the pipe and equipped with a close-fitting collar on each side of the floor, ceiling, or partition to maintain proper centering of the pipe.

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CHAPTER 8 HAZARDOUS INDUSTRIAL PROCESSES AND OPERATIONS

Ref: (a) Industrial Process Instruction 0985-901, Hot-Work Fire Safety
(b) NAVSHIPYDPUGETINST P11320.2, Fire Prevention and Protection for Radioactive Material Storage Areas, Radiologically Controlled Areas, Nuclear Ships and Submarines
(c) National Fire Protection Association (NFPA) 51B, Standard for Fire Prevention in Use of Cutting and Welding Processes
(d) OSHA 29 CFR 1910.252, Welding, Cutting, and Brazing, General Requirements
(e) NFPA 33, Spray Application Using Flammable and Combustible Materials
(f) OSHA 29 CFR 1910.107, Spray Finishing Using Flammable and Combustible Materials

1. Purpose. This chapter identifies general fire safety precautions and regulations for various hazardous processes and operations conducted in the Shipyard.

2. Policy

a. Hot-Work Operations

(1) Hot-Work Operations Aboard Submarines and Ships assigned for overhaul, conversion, repair, or other availability shall be in accordance with reference (a) and do not require authorization by the Fire Division.

(2) Hot Work In and Adjacent to Areas Where Radioactive Material Is Stored shall be in accordance with reference (b), Chapter 3.

(3) Permissible Hot-Work Areas are areas approved by the Fire Division, which are of noncombustible or fire-resistive construction, free of combustible and flammable contents, and suitably separated from adjacent areas which allow a permanent hot-work permit to be issued.

(a) Approved hot-work areas shall be posted and identified by posting Hazardous Operation Permit, PSNS 11320/17 (Rev. 11-89), in the area.

(b) Approved hot-work areas shall be authorized for a period not to exceed one year.

(4) Hot Work in Other Than Permissible Hot-Work Areas. Hot work shall not be performed in any area other than approved hot-work areas without authorization by the Fire Division. In accordance with references (c) and (d), the following responsibilities shall be followed to request authorization and to conduct hot work:

(a) Hot-Work Supervisor

1. Ensures that the hot-work operation will be accomplished in accordance with appropriate work procedures and standard safe work practices.

2. Preventing hot-work fires can be best achieved by separating the combustibles from the ignition source or by shielding the combustible materials. Protect combustibles from ignition by:

a. Having the work moved to a location free from dangerous combustibles.

b. If the hot-work operation cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition.

c. See that hot-work operations are scheduled so that operations that might expose combustibles or flammable liquids to ignition are not started during hot-work operations.

3. Assure that the hot-work person secures authorization from the Fire Division prior to initiating hot-work.

4. See that the fire watch person is on site equipped and prepared to perform the fire watch function.

5. Ensure that there are no ignitable vapors present.

6. Ensure adequate number of fire watches are present and positioned.

(b) Hot-Work Person

1. Request Hazardous Operation Permit, PSNS 11320/17 (Rev. 11-89) from the Fire Division, extension 6-3393.

2. Do not initiate hot work until authorization is received.

3. Handle the equipment safely and so to not endanger lives and property.

4. Continue hot-work operations only as long as conditions are unchanged from those under which approval was granted.

5. Ensure the fire watch is properly equipped with a hard hat, goggles, and a fully charged carbon dioxide or water pressure fire extinguisher, as directed by the Fire Division.

(c) Fire-Watch Person

1. Complete approved fire watch training.

2. Must be present during all hot-work operations and must remain alert and attentive to the work in progress.

3. Must be equipped with a hard hat, goggles, and a fully charged carbon dioxide or pressurized water fire extinguisher, or as directed by the Fire Division.

4. May not engage in any other activity or work during the hot-work operation.

5. Must remain at the work site for 30 minutes after all hot work has been completed to ensure that smoldering fires have not been overlooked.

(d) Fire Division (Code 1124). On request, inspects the proposed work site. Before hot-work operations are permitted, the area shall be inspected by the Fire Division. The Fire Division shall designate precautions to be followed on the Hazardous Operation Permit, PSNS 11320/17 (Rev. 11-89). The Fire Division shall authorize the hot work and verify that:

1. Hot-work equipment to be used is in satisfactory operating condition.

2. Where practical, all combustibles shall be relocated at least 35 feet horizontally from the work site. Where relocation is impractical, combustibles shall be protected with flame-retarded covers.

3. Openings or cracks in walls, floors, or ducts within 35 feet of the site shall be tightly covered to prevent the passage of sparks to adjacent areas.

4. Hot work near walls, partitions, ceiling, or roof of combustible construction, fire-resistant shields or guards

shall be provided to prevent ignition. If welding is to be done on metal wall, partition, ceiling or roof, precautions shall be taken to prevent ignition of materials on the other side by relocating the materials or placing a fire watch person on the opposite side of the work area.

5. Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be undertaken if the work is close enough to cause ignition by conduction.

6. Fully charged and operable fire extinguishers appropriate for the type of possible fire, shall be available at the work site.

7. When hot work is to be performed in close proximity to a sprinkler head, a wet rag shall be positioned over the sprinkler head and then removed at the conclusion of the hot-work operation. Additional precautions shall be taken to avoid accidental operation of other fire detection systems and equipment.

(5) Hazardous Operation Permit, PSNS 11320/17, (Rev. 11-89)

(a) The permit will provide special instructions and the essential precautions and will be issued for a specified period of time.

(b) Re-inspection will be required for hot work performed beyond the authorized period or for any situation in which conditions change from those under which approval was granted.

(c) The permit will remain on-site in the possession of the hot-work person for the duration of the operation.

(6) General Hot-Work Fire Prevention Precautions

(a) Cutting or welding shall not be permitted:

1. In areas not authorized by the Fire Division.

2. In sprinklered buildings while such protection is impaired.

3. In the presence of explosives atmospheres or explosives atmospheres that may develop inside uncleaned or improperly prepared drums, tanks, and other containers and equipment that previously contained such materials or that may develop in areas with an accumulation of combustible dusts.

(b) All hot-work operations require a fire watch.

(c) The safety requirements for operation of flammable gas cylinders and apparatus shall be in accordance with Volume V, Chapter 2 of this manual.

(d) Where hot-work processes cannot be properly safeguarded in making necessary repairs, such repairs shall be accomplished by safer means, such as by drilling, sawing, bolting, or other appropriate means.

b. Cleaning with Flammable and Combustible Liquids

(1) Flammable liquids shall only be used for their intended purpose. Class I and Class II liquids shall not be used for cleaning floors or walls.

(a) Cleaning operations will be performed with high-flash point or nonflammable-safety solvents unless authorized by written engineering guidance provided by Code 106.

(b) Where permitted, parts cleaning and degreasing with Class I and Class II liquids shall be conducted in UL listed and FM approved machines which meet OSHA and NFPA Standards.

1. Free-standing units shall have foot-operated lids that close automatically on release.

2. Bench units shall have fusible link actuated covers that close in the event of a fire.

(c) Covers shall be kept closed when tanks are not in use.

c. Spray Application Using Flammable and Combustible Materials

(1) General

(a) Spray-application operations of flammable and combustible materials shall be in accordance with references (e) and (f) and this section. Shipboard spray-painting operations shall be in accordance with Volume VI, Chapter 7 of this manual.

(b) Spray painting shall not be conducted within buildings unless standard spray booths and exhaust systems are provided. Spray-application operations of flammable and combustible materials shall be confined to properly designed and constructed spray booths or spray rooms.

(c) Spray booths shall be separated from other

operations by not less than 3 feet, by a wall or partition, or by a greater distance as required by the Fire Division.

(d) A clear space of not less than 3 feet around the booth shall be kept free of storage or combustible material.

(2) Ventilation

(a) Spray areas shall be provided with mechanical ventilation adequate to confine and remove flammable or combustible vapors or mists to a safe location, and to maintain the concentration of flammable or combustible vapors or mists below 10% of the lower flammable limit of the material being applied.

(b) Mechanical ventilation shall be kept in operation at all times while spraying operations are being conducted. Continued ventilation is required until combustible vapors can be maintained below 10% of the Lower Explosive Limits (LEL) without ventilation.

(3) Sources of Ignition

(a) Electrical Wiring and equipment located in a spray area shall be approved for Class I, Division 1 locations.

(b) Electrical wiring and equipment located adjacent to a spray area shall not produce sparks under normal operating conditions:

1. Open-Face Booths or Rooms. If the ventilation system is interlocked with the spraying equipment so as to make the spraying equipment inoperable when the ventilation is not in operation, the Class I, Division 1 area shall extend 5 feet out from the open face. If not interlocked, the area shall extend 10 feet. Electrical wiring and equipment within 3 feet of all other openings shall be Class I, Division 1.

2. Open-Top Booths or Rooms. The space 3-feet vertically above the booth and all other openings shall be Class I, Division 1.

3. Enclosed Spray Booths or Rooms. The space adjacent to the booth or room shall be considered nonhazardous except for the space within 3 feet of all openings. Electrical

wiring and equipment in these areas shall be suitable for Class I, Division 1 locations.

(c) Electric lights within 20 feet of any spray area shall be totally enclosed, and shall be protected from mechanical damage by guards.

(d) Portable lights shall not be used in any spray area during spraying operations except where fixed lighting is unavailable in the spray area. In such cases, portable lighting shall be approved for Class I, Division 1 locations.

(e) All metal parts of spray booths shall be electrically grounded.

(4) Fire Protection

(a) Spray areas shall be protected by an automatic fire extinguishing system. Where wet-pipe automatic sprinkler protection is not available, a spray booth may be protected with a dry-chemical extinguishing system.

(b) A minimum of one fire extinguisher with a minimum UL rating of 20B shall be provided near spray areas.

(5) Operation and Maintenance

(a) Spraying shall not be conducted outside of approved spray areas.

(b) Spray areas shall be kept free from the accumulations of deposits of combustible residues with cleaning conducted, as necessary.

(c) Residues removed during cleaning shall be immediately removed from the premises and properly discarded.

(d) Replace overspray collector filters before excessive restriction to air flow occurs.

(e) Approved metal waste cans shall be provided whenever rags or wastes are impregnated with sprayed materials and all such waste shall be deposited immediately after use. The contents of waste cans shall be properly dispose of daily.

(f) Sprinklers protecting spraying areas shall be clean and protected against overspray residue. If coverage is provided, polyethylene or cellophane bags, having a thickness of 0.0003 inches or less, or thin paper bags shall be used and replaced, as needed. If not covered, sprinklers shall be replaced annually.

(g) No Smoking signs shall be posted at all spray areas.

(h) The storage and handling of flammable and combustible liquids in connection with spraying operations shall be in accordance with applicable sections of Volume V, Chapter 1 of this manual.

d. Bowling Alley Resurfacing and Refinishing

(1) Resurfacing and refinishing operations shall not be carried on while the building is open for business.

(2) The Fire Division shall be notified prior to alleys being refinished or resurfaced.

(3) Approved ventilation shall be provided.

(4) Heating, ventilating, or cooling systems employing recirculation of air shall not be operated during resurfacing and refinishing operations, or within four hours following the application of flammable finishes.

(5) Electric motors and other equipment in the area which might be a source of ignition shall be secured during the application and for one hour thereafter.

(6) Smoking and the use of open-flame devices shall be prohibited.

e. Application of Tar, Asphalt, and Similar Materials

(1) Asphalt Kettles

(a) Shall not be transported when the heat source for the kettle is operating. An exception is asphalt kettles in the process of patching road surfaces may be transported with the heat source operating.

(b) Shall not be used inside or on the roof of a building.

(c) Shall not be located within 20 feet of any combustible material, combustible building surface, or building opening.

(d) Shall have an attendant within 100 feet of the kettle when the heat source is operating.

(e) Shall be provided with tight-fitting covers.

(f) A minimum of a UL rated 20-B:C portable fire extinguisher shall be located within 30 feet of each asphalt kettle when the heat source is operating.

(g) A minimum of a UL rated 20-B:C portable fire extinguisher shall be located on roofs during asphalt-coating operations.

(2) A Hazardous Operation Permit, PSNS 11320/17 (Rev 11-89) shall be obtained from the Fire Division prior to igniting the heat source.

f. Battery Charging. Batteries in use today are generally lead and nickel-iron. They contain corrosive chemical solutions, either acid or alkali. When charging, they give off hydrogen and oxygen which, when combined in certain concentrations, can be explosive.

(1) Battery-charging operations shall be performed by trained and designated personnel and only in specified, well-ventilated areas away from open flames, sparks, electric arcs, and manufacturing and service areas. Smoking shall be prohibited in the charging area.

(2) Vent caps shall be kept in place when charging batteries to avoid electrolyte spray. Care shall be taken to ensure vent caps are functioning.

(3) Battery or compartment cover(s) shall remain open during charging to dissipate heat and gas.

g. Dust Control. Dust is pulverized particles which if mixed with air, in the proper proportions, may become explosive and be ignited by a flame or a spark or other sources of ignition.

(1) Equipment, processes, and operations that involve dust consisting of pulverized, combustible particles of any material that, if mixed with air in the proper proportions, becomes explosive and may be ignited by flame or spark if in a confined volume. In areas where this has been determined to be a hazard, suitable dust collection equipment shall be installed and accumulation of dust shall be kept at a minimum in the building.

(2) Accumulation of dust shall be kept at a minimum in the interior of buildings. Dust that accumulates on beams, ledges, or other surfaces is extremely hazardous.

(3) Cleaning shall be done in a manner that prevents dust from becoming airborne. Dust shall not be blown down unless authorized by specific engineering guidance provided by Code 106.

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VOLUME IV - GENERAL FIRE PREVENTION REGULATIONS

CHAPTER 9 OUTDOOR FACILITIES AND OPERATIONS

1. Purpose. This chapter identifies fire prevention regulations and responsibilities for outdoor facilities and operations.

2. Policy

a. Barbecues

(1) The general use of charcoal or propane barbecues is prohibited within the Shipyard. The Employee Services Committee Food Service Division (Code 1113.6), Code 800 Messing and Billeting Operations, and Ship's Force Mess activities may barbecue upon inspection and approval by the Fire Division.

(2) Special event/fund raising barbecues may be authorized by Department/Office Heads and inspected and approved by the Fire Division.

(a) Approved units shall not be lit with other than approved lighting fluids. Units shall not be lit indoors or under/near combustible structures.

(b) No flammable liquids shall be within 50 feet of barbecues.

(c) A fire watch with a water-type extinguisher shall be present at all times.

(d) Upon completion, used charcoal shall be placed in a lidded metal container and/or doused with water to assure coals are completely out.

(3) The occupants of Shipyard Officer's Housing and Eastpark Housing areas are exempt from these provisions. However, housing occupants are expected to follow sound safety practices and exercise good judgment with the use of barbecues.

b. Open Burning. Open fires for the burning of trash, leaves, grass, or classified documents or similar materials are prohibited.

c. Tampering With and Obstruction Fire Alarm Equipment. No person shall alter, tamper with, damage, obstruct, or otherwise disturb any apparatus, equipment, or system under the supervision and control of the Fire Division without the permission of the Fire Division.

d. Tampering With and Obstruction of Fire Hydrant or Fire Appliance

(1) The placement of equipment, shrubbery, or any item that restrict or unreasonably delays the utilization of fire hydrants, sprinkler connections, post-indicator valves, hoses, alarm boxes, and hose connections is prohibited.

(2) No person shall remove, tamper with, obstruct, or otherwise disturb any fire hydrant or fire appliance without the permission of the Fire Division.

(a) No material or vehicle of any kind will be allowed to remain within 7 feet of a fire hydrant.

(b) Fire hydrants, siamese connections, post indicator-valves, and other control valves shall be clearly visible and free of all obstructions.

e. Hydrant Use Approval. No person shall use or operate any hydrant or other valves installed on any water system intended for the use by the Fire Division without the authorization of the Fire Division.

f. Building Identification. Building identification numbers shall be provided and maintained in such a manner that they can be seen by personnel at a distance.

g. Storm Drains, Sewers, and Waterways. The discharge of any flammable or combustible liquids into storm drains, sewers, or waterways is strictly prohibited.

h. Fireworks

(1) Except for command controlled displays, the possession of explosives and fireworks (for sale, storage, or use), including family housing areas, shall be prohibited.

(2) The storage or use of black or smokeless powder is prohibited in family housing areas.

i. Excavations. Care shall be taken in excavating around natural gas mains, gasoline, oil pipelines, utilities, water mains, and fire protection systems.

j. Weeds And Grass

(1) Grass and brush within 25 feet of structures shall be kept trimmed.

(2) Trash and dry vegetation shall not be permitted to accumulate around structures.

k. Trash Collection Units. Central trash collection units shall be placed 15 feet or more away from wood frame or metal buildings or from openings in masonry-walled buildings.

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VOLUME IV - GENERAL FIRE PREVENTION REGULATIONS

CHAPTER 10 FIRE DIVISION ACCESS

1. Purpose. This chapter identifies policy, regulations, and responsibilities in maintaining emergency access to Shipyard buildings, ships, and facilities.

2. Policy

a. Building Access. When access to a building or area is unduly difficult because of secured openings, or where immediate access is necessary for fire-fighting purposes; the Fire Division is authorized to require a key box to be installed in an accessible location, of an approved type which shall contain the keys necessary to gain access.

* b. Street and Road Closures. The Fire Division shall be notified (2796 or 5941) prior to all street and road closures. Street and road accessibility shall not be prohibited or impeded, preventing the ability of fire apparatus to respond to emergencies. If the blockage will be longer than 4 hours, then a written request with diagrams must be submitted to, and approved by, the Fire Chief. Approval of such closures shall not be authorized if such closure prevents access by Fire Division's fire apparatus and equipment.

c. Minimum Clearances of Fire Apparatus Access on Streets and Piers

(1) The unobstructed width of fire apparatus access shall not be less than 20 feet.

(2) The minimum vertical clearance of fire apparatus access shall not be less than 13 feet, 6 inches.

d. The required width of fire apparatus access shall not be obstructed in any manner including the parking of vehicles and the temporary establishment of lay-down areas, or similar operations.

e. Minimum required widths and clearances shall be maintained at all times.

f. On piers and around dry docks, the areas between the crane tracks, painted cut-throughs, turn-arounds, and fire lanes shall not be obstructed in any manner.

g. Fire lanes shall not be used for lay down or other purposes. Temporary closure of fire lanes shall be permitted only with the approval of the Fire Division. Permission will normally be given if alternate access routes are available.

h. The temporary blockage of fire lanes for loading and unloading vehicles shall be permitted, provided that the vehicle causing the temporary blockage can be moved quickly. In these cases, the driver shall be required to stay with the vehicle.

i. Established Fire Lanes. Exhibits IV-10-1 through IV-10-3 provide identification of essential fire lanes in the Industrial Area that must be maintained clear at all times.

j. Responsibilities

(1) Facilities and Maintenance Officer (Code 910) shall mark fire lanes as indicated by figures 1 through 3 as required by the Fire Division. Areas around piers and dry docks shall be marked every 20 yards, "FIRE LANE, NO PARKING, NO MATERIAL."

(2) Law Enforcement Branch (Code 1121.1) shall be responsible to patrol and enforce fire lanes to assure access by emergency response vehicles is maintained.

(3) Operations Officer (Code 300) shall be responsible for maintaining emergency access to areas under the cognizance of the Operations Department to include access around dry docks and piers.

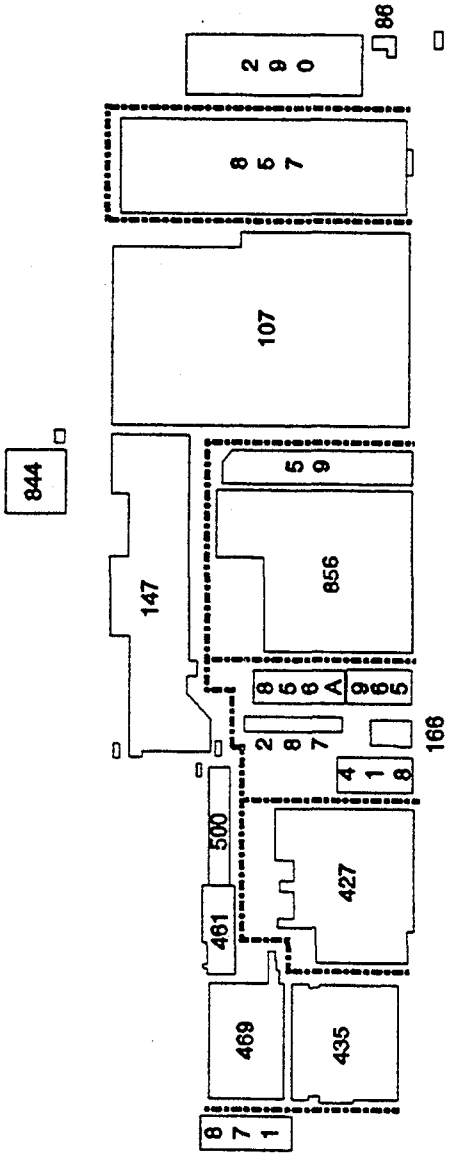

EXHIBIT IV-10-1
FIRE LANES DISTRICT ONE

Enclosure (1)

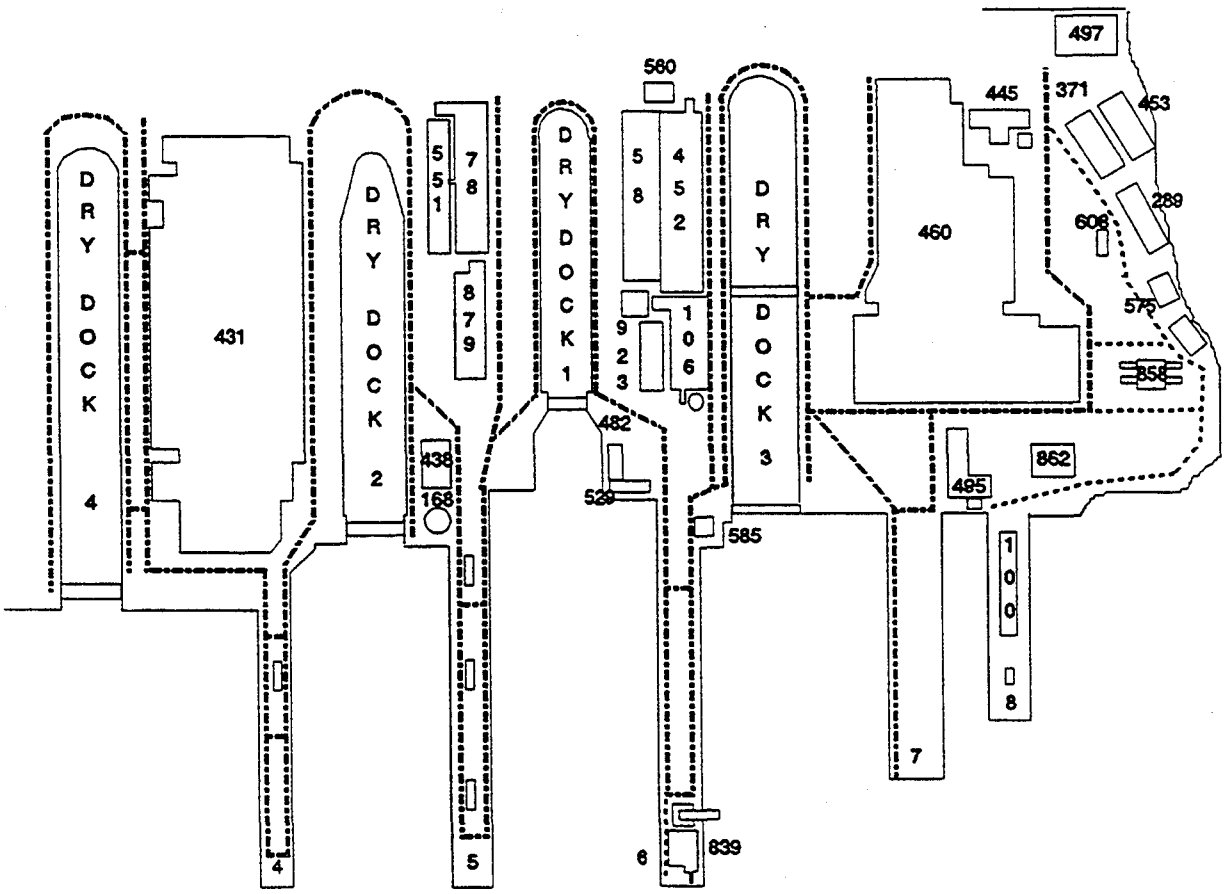

EXHIBIT IV-10-2
FIRE LANES DISTRICT TWO

Enclosure (1)

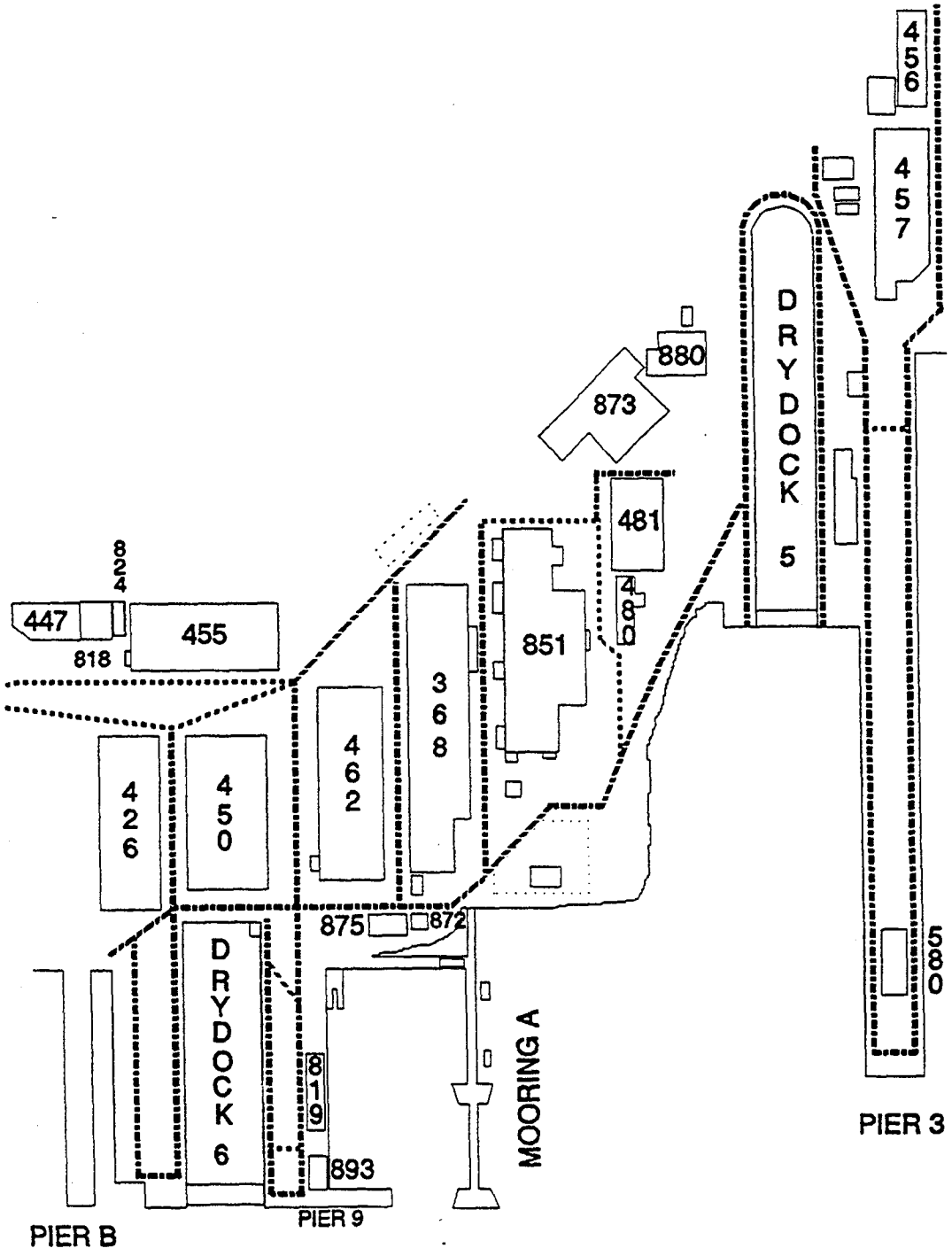

EXHIBIT IV-10-3
FIRE LANES DISTRICT FOUR

Enclosure (1)

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VOLUME IV - GENERAL FIRE PREVENTION REGULATIONS

CHAPTER 11 COMMERCIAL FOOD PREPARATION FACILITIES

Ref: (a) Military Handbook 1008A Fire Protection for Facilities Engineering, Design, and Construction
(b) National Fire Protection Association (NFPA) 96, Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment
(c) NFPA 58, Storage and Handling of Liquified Petroleum Gases
(d) NFPA 54, National Fuel Gas Code

1. Purpose. This chapter identifies fire prevention regulations for the operation of commercial cooking facilities.

2. Policy. The operation of commercial food preparation facilities shall be in accordance with references (a) through (d), and this manual.

a. Ventilating Hood and Duct Systems in Dining and Food Preparation Facilities. Large ranges and ventilation systems in kitchen areas of dining and food preparation facilities present a serious potential for fire loss. Cooking grease and oil heated to its flash point and ignition of grease and soot deposits inside ventilating ducts are the chief sources of fire danger. The majority of such fires in food preparation facilities have been contributed to inadequate installation and/or maintenance of range and ventilation systems.

(1) Installation

(a) A ventilating hood and duct system shall be provided for all commercial-type food heat-processing equipment that produces grease-laden vapors.

(b) An approved fire suppression system shall be provided which shall provide protection of cooking surfaces, deep fat fryers, griddles, upright broilers, char-broilers, range tops, grills, and for the enclosed plenum space within the hood, above filters and exhaust ducts serving the hood.

1. Automatic fire-extinguishing systems shall be interconnected to the fuel or current supply so that the fuel or current is automatically shut off to all equipment under the hood when the system is actuated.

2. A readily accessible manually activating device installed at an approved location shall be provided. Instructions for manually operating the fire extinguishing system shall be posted near the manual-activating device and shall be reviewed periodically with employees.

3. When such alarm system is provided, the operation of the extinguishing system shall sound a general building alarm and automatically signal NESCOM, via the Gamewell Fire Alarm System.

(2) Portable Fire Extinguisher. A minimum of one portable fire extinguisher shall be installed in the commercial kitchen cooking area with a minimum UL rating of 40-B.

(3) Maintenance

(a) Extinguishing systems shall be serviced every six months and after activation of the system. All actuation components including remote manual pull stations, mechanical or electrical devices, detectors, and actuators shall be checked for proper operation. Fusible links and automatic sprinkler heads shall be replaced annually. Inspection shall be by a qualified individual, and a certificate of inspection shall be forwarded to the Fire Division.

(b) Hoods, grease removal devices, fans, ducts, and other associated equipment shall be cleaned/inspected every six months. Documentation of cleaning/inspection will be provided to Code 1124 indicating the date and the equipment cleaned/inspected.

1. Flammable solvents or other flammable cleaning agents shall not be used.

2. When cleaning procedures are completed, all electrical switches, detection devices, and other system components shall be returned to an operable state.

(4) Operation

(a) Exhaust systems shall be operated during all periods of cooking.

(b) Grease filters shall be in place when equipment under a kitchen grease hood is used.

(c) Cooking equipment shall not be operated while fire extinguishing system or exhaust system is nonoperational or impaired.

b. Cooking Equipment

(1) All cooking equipment shall be listed and installed in accordance with the manufacturer's instructions.

(2) All deep-fat fryers shall be installed with at least a 16-inch space between the fryer and surface flames from adjacent cooking equipment.

(3) All deep-fat fryers shall be equipped with a separate high-limit control in addition to the adjustable operating control to shut off fuel or energy when fat temperature reaches 475°F.

(4) The installation of gas-fired cooking appliances shall be in accordance with reference (d).

(5) Portable gas or liquid fueled cooking equipment shall not be permitted in commercial cooking facilities. Listed and approved LP-Gas commercial food service appliances shall be permitted to be used inside restaurants and attended commercial food catering operations, provided that no commercial food service appliance shall have more than two 10-ounce nonrefillable butane gas containers having a maximum water capacity of 1.08 pounds per container.

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* Volume V - HAZARDOUS SUBSTANCE REGULATIONS

CHAPTER 1 FLAMMABLE AND COMBUSTIBLE LIQUIDS

Ref: (a) National Fire Protection Association (NFPA) 30, Flammable and Combustible Liquid Code
(b) OSHA 29 CFR 1910.106, Flammable and Combustible Liquids
(c) OSHA 29 CFR 1910.178, Powered Industrial Trucks
(d) NFPA 505, Fire Safety Standard For Power Operated Industrial Trucks
(e) NAVFAC P-300, Management of Transportation Equipment
(f) NFPA 385, Standard for Tank Vehicles for Flammable and Combustible Liquids

1. Purpose

a. This chapter provides general guidelines and regulations regarding the storage, handling, and use of flammable and combustible liquids.

b. The provisions of this chapter describe the control of hazards of fire involving flammable and combustible liquids. These regulations may not provide adequate protection for operations involving hazardous substances or chemical reactions nor do they consider health hazards resulting from exposure to these substances, or environmental requirements, particularly relating to the pollution of waterways.

2. Introduction

a. Strictly speaking, flammable and combustible liquids do not cause fires; they are merely contributing factors. It is the vapor from the evaporating liquid rather than the liquid itself that burns or explodes when mixed with air in certain proportions, in the presence of a source of ignition.

b. The prevention of the ignition of flammable and combustible liquid vapor is based on one or more of the following principles:

(1) Exclude the sources of ignition.

(2) Exclusion of air (oxygen).

(3) Storage of flammable and combustible liquids in closed containers, and minimizing the quantity of liquid exposed while in use.

(4) Ventilation to prevent the accumulation of vapor within the flammable range.

Enclosure (1)

(5) Use of an atmosphere of inert gas instead of air.

3. Definitions

a. Combustible Liquid. A liquid having a flash point at or above 100°F. Combustible liquids are further categorized as:

(1) Class II Liquid. Those liquids having a flash point at or above 100°F or below 140°F. Class II liquids have HAZMAT labels with a flammability rating of 2.

(2) Class IIIA Liquid. Those Liquids having a flash point at or above 140°F or below 200°F. Class IIIA liquids have HAZMAT labels with a flammability rating of 2.

(3) Class IIIB Liquid. Those liquids having a flash point at or above 200°F. Class IIIB liquids have HAZMAT labels with a flammability rating of 1. These liquids are not included within the scope of this chapter. Class IIIB liquids have the same storage requirements as ordinary combustible materials, except as identified for general purpose warehouses.

b. Closed Container. A can, barrel, drum, or vessel of a capacity of 60 gallons or less used for transporting or storing of flammable or combustible liquids, so sealed by means of a lid or other device that neither liquid or vapor will escape from it at ordinary temperatures.

c. Flammable Liquid. A liquid having a flash point below 100° F is a Class I Liquid. Flammable liquids are further categorized as:

(1) Class IA Liquid. Those liquids having a flash point below 73°F and having a boiling point below 100°F. Class IA liquids have HAZMAT labels with a flammability rating of 4.

(2) Class IB Liquid. Those liquids having a flash point below 73°F and having a boiling point at or above 100°F. Class IB liquids have HAZMAT labels with a flammability rating of 4.

(3) Class IC Liquid. Those liquids having a flash point at or above 73°F and below 100°F. Class IC liquids have HAZMAT labels with a flammability rating of 3.

d. Flammable Liquid Storage Cabinet. An approved storage cabinet designed and constructed to provide for the safe storage of up to 60 gallons of Class I and Class II liquids inside a building.

e. Fire Area. An area of the building separated from the remainder of the building by construction having a fire-resistance

rating of at least 1 hour and having all openings properly protected by assemblies having a similar fire-resistance rating.

EXHIBIT V-1-1
FLAMMABLE AND COMBUSTIBLE LIQUID CLASSIFICATION

NFPA 30 Class	Flash Point	NFPA 704 Label	Definition
IA	Below 73°F Boiling Point below 100°F	4	Materials which will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or which are readily dispersed in air and which will burn readily.
IB	Below 73°F Boiling Point above 100°F	4	Materials which will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or which are readily dispersed in air and which will burn readily.
IC	73°-100°F	3	Liquids that can be ignited under almost all ambient temperature conditions.
II	100°F-140°F	2	Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.
IIIA	140°-200°F	2	Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.
IIIB	Above 200°F	1	Materials that must be preheated before ignition can occur.

f. Flash Point. The minimum temperature of a liquid at which sufficient vapor is given off to form an ignitable mixture with the air near the surface of the liquid within the tank.

g. Safety Can. An approved container, of not more than 5-gallons capacity, having a spring-closing lid and spout cover, and so designed that it will safely relieve internal pressure when subjected to fire exposure.

4. Policy. The storage, handling, and use of flammable and combustible liquids shall be in accordance with references (a) through (f) and this chapter.

a. Storage Limits for Inside Storage of Flammable and Combustible Liquids. The storage of flammable and combustible liquids in buildings is regulated to limit the total quantity of liquids permitted to be stored in any one fire area and is based on a tiered approach. Total quantity limits are established by type of occupancy. In certain occupancies, the use of flammable liquid storage cabinets allows additional storage, but limits the use of storage cabinets to no more than three cabinets in a fire area. When flammable and combustible liquid storage requirements exceed specified occupancy limits, an intermediate level of inside storage is permitted in specially constructed separate inside storage areas, which provides for relatively larger storage capacity of flammable and combustible liquids. Bulk quantities of flammable and combustible liquids are required to be stored in flammable liquid warehouses. The storage of Class I, II, or IIIA liquids inside buildings shall be limited to the quantities established in this section. The amounts permitted shall be stored in approved closed containers, in approved locations, and shall be limited in accordance with the following:

(1) Dwellings Containing Not More Than Three Units

(a) Storage in excess of 25 gallons of Class I and Class II liquids combined is prohibited.

(b) Storage in excess of 60 gallons of Class IIIA liquids is prohibited.

(2) Assembly Occupancies, BEQ And BOQ Facilities, and Buildings Containing More Than Three Dwellings. Total storage in excess of 10 gallons of Class I and Class II liquids combined or 60 gallons of Class IIIA liquids shall be stored in storage cabinets.

(3) Office Occupancies. Storage shall be limited except to that required for operation of office equipment and maintenance.

(a) Containers for Class I liquids shall not exceed a capacity of 1 gallon, except that safety cans can be of 2-gallon capacity.

(b) Not more than 10 gallons of Class I and Class II liquids combined can be stored in a single fire area outside of a flammable liquid storage cabinet.

(c) If stored in safety cans, not more than 25 gallons of Class I and Class II liquids combined can be stored in a single fire area outside of a flammable liquid storage cabinet.

(d) Not more than 60 gallons of Class IIIA liquids shall be stored outside of a flammable liquid storage cabinet.

(4) Industrial Occupancies. The quantity of liquid that may be located outside of storage cabinets, inside storage rooms, cut-off rooms and attached buildings, general purpose warehouse, or liquid warehouse shall not exceed the greater of the quantity of either:

(a) A supply for one day or

(b) 25 gallons of Class IA liquids in containers

(c) 120 gallons of Class IB, IC, II, or IIIA liquids in containers.

(d) Not more than three flammable liquid storage cabinets may be located in a single fire area, except that in industrial areas additional cabinets may be located in the same fire area if the additional cabinet, or group of not more than three cabinets, is separated from other cabinets or group of cabinets by at least 100 feet.

* (e) Parking of vehicles inside buildings, except designated vehicle repair shops, shall be approved by the Fire Chief. A written request must be submitted by a Department Head or Department Fire Warden.

(5) Retail Business Occupancies

(a) In display areas that are accessible to the public, the storage of Class I, Class II, and Class IIIA liquids shall be limited to the quantities needed for display and normal merchandising purposes, but shall not exceed 2 gallons per square foot of floor area being utilized for merchandising Class IB, IC, or IIIA liquids. Merchandising of Class IA liquids is limited to 1 gallon per square foot.

(b) The aggregate quantity of additional stock in areas not accessible to the public shall not exceed the following limitations unless the area is protected by automatic sprinklers; in which case, the quantities may be doubled.

1. Class I and Class II liquids combined shall not exceed 240 gallons.

2. Class IIIA liquids shall not exceed 660 gallons.

(6) General Storage Warehouses

(a) The storage of flammable and combustible liquids in general purpose warehouses protected by automatic sprinklers shall be in accordance with the following:

1. Class IA liquids are not permitted to be stored in general purpose warehouses.

2. Class IB and IC liquids in containers not to exceed a capacity of 1 gallon, with a total capacity to not exceed 660 gallons. The height of the liquid storage shall not exceed 5 feet.

3. Class II liquids in containers not to exceed a capacity of 5 gallons, with a total capacity to not exceed 1,375 gallons. The height of the liquid storage shall not exceed 5 feet.

4. Class IIIA liquids in containers not to exceed a capacity of 60-gallons, with a total capacity to not exceed 2,750 gallons. The height of the liquid storage shall not exceed 10 feet.

5. Class IIIB liquids in containers not to exceed a capacity of 60 gallons, with a total capacity to not exceed 13,750 gallons. The height of the liquid storage shall not exceed 15 feet.

6. Class I and Class II liquids in plastic containers shall not be stored in general purpose warehouses without the permission of the Fire Division.

7. Where ordinary combustible materials are stored in the same area as flammable and combustible liquids, the minimum distance between the two types of storage shall be 8 feet.

8. Where liquids are stored on racks, a minimum 4-foot wide aisle shall be provided between rows and adjacent storage of liquids.

9. Aisles shall be provided so that no container is more than 12 feet from any aisle.

10. Main aisles shall be a minimum of 8-foot wide.

(b) The storage of flammable and combustible liquids in general purpose warehouses not protected by automatic sprinklers is not permitted.

(7) Flammable And Combustible Liquid Warehouses

(a) The total quantity of flammable and combustible liquid storage in a liquid storage warehouse is not restricted. However, liquid warehouses must meet more restrictive construction and design standards than all other types of storage facilities for flammable and combustible liquids.

(b) Maximum quantities per accumulation, maximum quantities per rack, and separation and aisle-width requirements will be enforced by the Fire Division in accordance with references (a) and (b). Specific guidance for these specialized facilities will be provided by the Fire Division.

(c) Dispensing of Class I and Class II liquids in flammable liquid warehouses is prohibited unless the dispensing area is separated by 2-hour, fire-rated construction and meets the additional design criteria of an inside storage room as defined by reference (a).

(d) Containers in piles shall be separated by pallets or dunnage to provide for stability and to prevent excessive stress on container walls.

(e) Limited quantities of combustible materials and empty or idle combustible pallets may be stored if the ordinary combustibles are separated from the liquid by a minimum of 8 feet.

(f) In accordance with references (c) and (d), only power operated industrial trucks of the type designated as DY, EE, or EX will be utilized in flammable and combustible liquid warehouses.

1. Markers indicating the designation of the type of truck shall be applied to each side of the vehicle in a visible location.

2. Entrances to areas where industrial trucks may enter shall be posted with signs indicating that only trucks marked with the approved designation are permitted in this area.

b. Fire Prevention Requirements for Inside Storage and Use of Flammable and Combustible Liquids

(1) Flammable Liquid Storage Cabinets. This section establishes standard requirements and guidelines for the

construction, placement, capacities, and general fire-protection practices of flammable liquid storage cabinets. Storage cabinet design and construction is intended to limit internal temperature inside the cabinet to not more than 325°F under conditions of flame and heat impingement.

(a) Construction of Flammable Liquid Storage Cabinets

1. Purchased flammable liquid storage cabinets shall be labeled with an approved laboratories listing label. Existing labeled and otherwise approved flammable liquid storage cabinets not equipped with self-closing doors shall be permitted providing the door is labeled "KEEP DOORS CLOSED."

2. Metal cabinets constructed in the following manner are acceptable:

a. The bottom, top, sides, and door of the cabinet shall be at least 18-gage steel and double-walled with 1-1/2" air space.

b. Joints shall be riveted, welded, or made tight by some equally effective means.

c. The door shall be self-closing with a three-point latch arrangement and the door sill shall be raised at least 2" above the bottom of the cabinet to retain spilled liquid within the cabinet.

3. Flammable liquid storage cabinets shall be marked in conspicuous lettering, "FLAMMABLE - KEEP FIRE AWAY."

(b) Venting of Flammable Liquid Storage Cabinets. Cabinets are not required to be vented for fire-protection purposes. The vent openings shall be kept tightly capped with the metal bungs provided for that purpose.

(c) Storage Capacity of Flammable Liquid Storage Cabinets. Not more than 120 gallons of Class I, II, and IIIA liquids may be stored in a cabinet. Of this total, not more than 60 gallons may be of Class I and Class II liquids.

(d) Location of Flammable Liquid Storage Cabinets

1. The location of flammable liquid storage cabinets shall be subject to the approval by the Fire Division.

2. Not more than three storage cabinets may be located in a single fire area, except that in an industrial occupancy, additional cabinets may be located in the same fire

area, if the additional cabinet, or group of not more than three cabinets, is separated from other cabinets or group of cabinets by at least 100 feet.

(e) Materials Required To Be Stored In Flammable Liquid Storage Cabinets. All materials with a Hazardous Material Commodity Label, PSNS 5101/25 (Rev. 11-82), with a flammability rating of 2 or greater, that exceed the occupancy limits of paragraph 4a are required to be stored in a flammable liquid storage cabinet.

(f) Materials That Shall Not Be Stored in Flammable Liquid Storage Cabinets

1. Water reactive materials (materials that react with water) shall not be stored with flammable or combustible liquids under any condition.

2. Materials that are primarily:

a. Compressed gasses

b. Flammable solids

c. Oxidizers

d. Unstable (reactive) materials

e. Corrosives

* (2) Separate Inside Storage Areas And Hazardous Substance Storage Lockers Used Inside. Separate inside storage areas may be established, with the approval of the Fire Division, where the need for flammable liquid storage exceeds the established limit for that occupancy. Separate inside storage areas provide for a relatively larger storage capacity for liquids, but establishes rigid requirements for the design, construction, and operation of these facilities. Consult the Fire Division for construction and design criteria for inside storage areas and hazardous substance storage lockers used inside.

(3) General Storage Requirements

(a) Fire Extinguisher Requirements for the Inside Storage of Flammable and Combustible Liquids

1. At least one portable fire extinguisher having a UL rating of not less than 20-B shall be located outside of, but not more than 10 feet from the door opening into any separate inside storage area.

2. At least one portable fire extinguisher having a UL rating of not less than 20-B shall be located not less than 10 feet nor more than 50 feet from any Class I or Class II liquid storage area outside of a separate inside storage area.

(b) Container Storage Requirements

1. Flammable and combustible liquids shall be stored in tanks or closed containers.

2. All flammable and combustible liquid containers will be labeled to indicate contents and by hazard utilizing Hazardous Substance Commodity Label, PSNS 5101/25 (Rev. 11-82).

3. Container storage under 30-gallon capacity shall not be stacked more than 3 feet or two containers high, whichever is greater, unless on fixed shelving or otherwise satisfactorily secured.

4. Containers over 30 gallons shall not be stored more than one container high.

5. All containers shall be stored in an upright position.

6. Safety cans used for storing or handling liquids with a flash point at or below 80°F shall be painted red and have the name of the contents conspicuously stenciled or painted on the container in yellow.

7. Materials shall be stored in approved containers. Class I and Class II liquids shall not be stored in glass containers.

8. Class I liquids shall not be permitted to be stored in basement areas. Class II and Class IIIA liquids may be stored in basement areas provided that automatic sprinklers are provided.

9. Flammable and combustible liquids shall not be stored so as to limit use of exits, stairways, or areas normally used for the safe egress of people.

10. Liquids used for building maintenance painting or other similar infrequent maintenance purposes may be stored temporarily in closed containers outside of storage cabinets or separate inside-storage areas, if limited in amount, not to exceed a 10-day supply at anticipated rates of consumption.

11. Precautions shall be taken to prevent the

flames, smoking, cutting and welding, hot surfaces, radiant and frictional heat, static electricity, electrical and mechanical sparks, spontaneous ignition, and ovens, furnaces and heating equipment.

12. Signs prohibiting smoking, welding, heat, spark-generating work or the use of open flames shall be posted in areas where flammable and combustible liquids are stored.

a. The restricted area shall extend out for a distance of 50 feet in all directions, except where separation by an approved fire barrier prevents the migration of flammable vapors.

b. The area shall be marked at the boundary, such that personnel traveling into the area are aware of the hazard and restrictions.

13. Materials with a water reactivity rating of 2 or higher shall not be stored in the same area as other flammable or combustible liquids.

14. The use of specialized, power-operated, industrial trucks in areas where Class I liquids are moved shall be in accordance with references (c) and (d).

(4) Dispensing and Use Requirements

(a) The use of flammable and combustible liquids will be rigidly controlled. Such material will be issued only for the amount required, and at the time needed to accomplish a specific job.

(b) Areas in which flammable or combustible liquids are transferred from one container to another shall be separated from other operations in the building that might represent an ignition source by adequate distance or by construction. Containment shall be provided to control spills. Adequate natural or mechanical ventilation shall be provided to prevent accumulation of vapor-air mixtures over one-fourth of the lower flammable limit. Containment shall be of sufficient volume to contain the largest container inside the containment.

(c) Flammable liquids shall be drawn from or transferred into containers or portable tanks only through a closed piping system, from safety cans, by means of a device drawn through the top, or from a container or tank by gravity through an approved self-closing valve.

1. Gravity discharge of flammable liquids having flash points below 80°F from tanks or drums is prohibited within buildings. The tank or drum shall be in an upright position using approved, manually operated barrel pumps in a location approved by the Fire Division.

2. Flammable liquids with a flash point above 80°F will be dispensed from drums equipped with an approved self-closing valve.

3. If hose is used in the transfer operation, it shall be equipped with a self-closing valve without a hold-open latch in addition to the outlet valve. Only listed or approved hose shall be used.

4. When flammable liquids are poured from one container to another, an electrical bond will be provided between the two containers prior to and during pouring to preclude the possibility of sparks from static electricity. The electrical bond will be made by use of a bonding wire. In cases of small containers (five gallons or less) bonding may be accomplished by keeping the nozzle in contact with the container during the entire process.

(d) Class I liquids may be used only where there are no open flames or other sources of ignition within the possible path of vapor travel.

(e) Where flammable and combustible liquids are used or handled, means shall be provided to dispose promptly and safely of leakage or spills.

(f) Cleaning with flammable and combustible liquids shall be in accordance with Volume IV, Chapter 8, paragraph 2b of this manual.

c. Outside Storage and Use of Flammable and Combustible Liquids. Outdoor storage of flammable and combustible liquids in containers and portable tanks shall be in accordance with this section. In addition to the fire-protection requirements of this section, environmental requirements, particularly relating to the pollution of waterways exist. Contact Code 106.3 for these additional requirements.

(1) Flammable and combustible liquids may be stored adjacent to a building provided that:

(a) The adjacent building wall has an exterior fire-resistance rating of 2 hours.

(b) There are no openings to areas at grade or above grade that are within 10 feet horizontally of the storage.

(c) There are no openings directly above the storage.

(d) There are no openings to areas below grade within 50 feet horizontally of the storage area.

(e) If these conditions cannot be met, a minimum distance of 25 to 50 feet shall be maintained between the building and the storage area. The required separation distance shall be established by the Fire Division.

(f) The storage area shall be graded in a manner to divert spills away from buildings or, other exposures, or shall be surrounded by a curb at least 6" high, or other similar containment measure approved by the Fire Division.

(g) The storage area shall be protected against tampering or trespass, and shall be secured when unattended.

(2) Spills and Discharges From Portable Tanks

(a) Portable tanks shall be designed and constructed of metal to meet the requirements of Chapter I, Title 49 of the Code of Federal Regulations (DOT).

(b) For fire-protection purposes, facilities shall be provided so that any accidental discharge of any Class I, II, or IIIA liquids will be prevented from endangering important facilities or waterways.

(c) Flammable and combustible liquids will not be emptied into sewage or storm drains, or dumped overboard.

(3) Operation of Tank Vehicles Containing Flammable and Combustible Liquids

(a) General

1. Drivers of tank vehicles shall be trained in the proper procedure for operating and loading and unloading tank vehicles.

2. Tank vehicles shall be marked in accordance with reference (e).

3. Tank vehicles shall not be operated unless they are in proper repair, without accumulation of grease, oil, or other flammable materials. Tank vehicles and their appurtenances shall be free of leaks.

4. Tank vehicles shall be provided with at least one portable fire extinguisher having a minimum UL rating of 2-A, 20-B:C rating, located in an accessible place. Extinguishers shall be inspected and maintained by Transportation in accordance with Volume III, Chapter 5, of this manual.

5. Dome covers shall be closed and latched when the vehicle is in transit.

6. Repairs shall not be made to tank vehicles unless the repairs can be made without hazard.

a. Loaded tank vehicles shall not be repaired in a closed garage.

b. Cargo tanks shall not be repaired by any method employing flame, arc, or other hot work processes, unless the tank is maintained gas free.

7. Tank vehicles transporting gasoline, whether empty or full, shall not be stored in any building or parked within 25 feet of any building.

(b) Loading and Unloading of Tank Vehicles shall only be performed in approved locations.

1. The driver of tank vehicle shall not leave the vehicle unattended while loading or unloading.

2. Smoking in the vicinity of a tank vehicle loading or unloading is forbidden. Extreme care shall be taken to keep fire away and to prevent persons in the vicinity from smoking, lighting matches, or carrying any lighted smoking material.

3. When transferring Class I liquids, the motors of vehicles shall be shut down during making and breaking of hose connections. If loading or unloading is done without requiring the use of the motor of the tank vehicle, the motor shall be shut down throughout the transfer operation.

4. No tank vehicle shall be loaded liquid full. Sufficient space shall be provided to prevent leakage by expansion due to rise in temperature during transit.

(4) Portable Fuel Tanks. The purpose of this section is to establish standard requirements and guidelines for the construction, inspection, and operation of portable fuel-dispensing tanks used on the waterfront. These requirements apply to both gasoline and diesel fuel portable tanks.

(a) Fire Extinguisher Requirements. Each portable fuel tank will be supplied with two extinguishers with a minimum UL rating of 60-B.

(b) Location of Portable Fuel Tanks

1. Portable fuel tanks shall be kept outside and at least 50 feet from any building, and shall not be located closer than 20 feet from any below grade structure, such as a dry dock.

2. Portable fuel tanks will not be allowed to be stored on piers for any reason. The fueling or defueling of any vehicle or equipment on piers or moorings is prohibited. Vehicles and equipment requiring fuel will be taken to the inshore end of the pier or mooring for refueling.

3. Fueling will not be performed inside buildings or within 50 feet of any building or any possible source of ignition.

4. Fuel tanks shall not be allowed in dry dock or aboard ship except during fueling operations. On completion, the fuel tank will be immediately removed.

(c) Fueling Operations

1. The engine of the vehicle or equipment shall be secured during fueling operations. The fueling of equipment with hot engine components that may ignite flammable vapor, is prohibited.

2. The operator conducting the fueling operations will make a visual inspection of the tank, hose, nozzle, other equipment, and possible sources of ignition, prior to conducting fueling operations.

* 3. The extinguishers provided at the fuel tank will be removed from the tank, and shall be stationed in a position where they can be utilized in an emergency.

* 4. A minimum of two personnel will conduct the fueling operation, one attending the nozzle and one operating the pump.

5. The dispensing nozzle must be attended at all times when in use. No wedges, locking arrangements, or other devices will be used that would prevent the instant stoppage of flow from the nozzle in the event of overflow or ignition of the fuel.

(d) Filling of Portable Fuel Tanks. No tank shall be filled to capacity. To prevent overfilling and leakage from tank openings or distortion of the tank by expansion of its contents due to rise in temperature, all fuel tanks will be filled to allow for a minimum of 5% expansion of the total tank volume.

(e) Inspection and Maintenance of Portable Fuel Tanks

1. Portable fuel tanks must be frequently inspected to ensure they are free of leakage, defective fittings and welds, damaged fuel hose, nozzles, and bonding straps. Shop 72 shall establish an inspection and maintenance program, which assures that the fuel tank and associated components are maintained without defects that may contribute to the unsafe operation of the unit.

2. The Fire Division shall have the authority to take portable tanks out of service if defects are apparent that may contribute to the unsafe operation of the unit.

* (5) Hazardous Substance Storage Lockers are relocatable, prefabricated structures intended to meet applicable requirements for outside storage of hazardous substance, including flammable and combustible liquids. When meeting specific requirements, and authorized by the Fire Division, these units can be used inside buildings. The following fire protection requirements apply to the use of lockers outside:

(a) Electrical wiring and equipment located inside storage lockers used for Class I liquids shall be suitable for Class I, Division 2. Electrical equipment shall not be permitted inside storage lockers that do not meet this requirement.

(b) Storage lockers shall be provided with either gravity or mechanical ventilation. Mechanical ventilation shall be provided if Class I liquids are dispensed within the storage locker.

(c) The storage of Class IA and the dispensing of Class IA and Class IB liquids is prohibited in lockers not equipped with explosion venting.

(d) Dispensing in storage lockers in excess of 1,000 square feet shall not be permitted.

(e) Secondary containment shall have sufficient capacity to contain 10% of the volume of containers allowed or the volume of the largest container, whichever is greater.

(f) Locations of storage lockers shall be approved by the Fire Division. Siting criteria shall be based on the construction characteristics of the storage locker and the exposed building. Once the designated site is approved, it shall not be changed without the approval of the Fire Division.

(g) To protect flammable liquids from ignition by static electrical discharge, an external grounding connection, grounding rod, and interior grounding lugs will be utilized.

(h) Storage lockers will be identified with the appropriate placards and NFPA 704M Diamond symbol.

(i) Fire Extinguishing System. An approved fire extinguishing system shall be installed and maintained in accordance with the appropriate NFPA standard on all storage lockers.

(6) Containers of gasoline shall not be carried within any government or privately owned vehicle while within the confines of the Shipyard. This shall not apply to approved safety containers not exceeding six gallons used to transport gasoline from service stations to private residences, for use in powered lawn and garden equipment and recreational vehicles.

* (7) Fuel Transfer for Portable Gas Powered Equipment

* (a) Equipment will not be fueled while running or until adequately cooled to ensure flammable vapors inherent to this operation will not be ignited.

* (b) Areas in which flammable or combustible liquids are transferred from one container to another shall be separated from other operations in the area that might represent an ignition source by an adequate distance or by construction.

* (c) Containment shall be provided to control spills. Adequate natural or mechanical ventilation shall be provided to prevent accumulation of vapor-air mixtures over one-fourth of the lower flammable limit. Containment shall be of sufficient volume to contain the largest container inside the containment. Product that is spilled will be cleaned up immediately.

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Volume V - HAZARDOUS MATERIAL REGULATIONS

CHAPTER 2 SAFE HANDLING OF FLAMMABLE-COMPRESSED GASES

Ref: (a) NAVSHIPYDPUGETINST P5100.66, Occupational Safety and Health Manual Vol. II, Chapter 11, Operation and Maintenance of Industrial Gas Equipment
(b) NAVSHIPYDPUGET P5100(1), Safety Manual For Operators of Oxy-Fuel Gas Equipment
(c) PRODDEPTINST 10330.3, Gases in Cylinders; Issuing and Handling of
(d) NAVSHIPYDPUGET P5100(9), Safety Manual For Safe Use of Inert Gases
(e) MIL-STD-101B, Color Code For Pipelines and For Compressed Gas Cylinders
(f) Safe Handling of Compressed Gases in Cylinders, Compressed Gas Association (CGA) Pamphlet-1
(g) NAVSUPINST 4440.128B, Storage and Handling of Compressed Gases and Gas Cylinders
(h) OSHA 29 CFR 1910.253, Oxygen-Fuel Gas Welding and Cutting
(i) National Fire Protection Association (NFPA) 58, Standard For the Storage and Handling of Liquified Petroleum Gases
(j) OSHA 29 CFR 1910.110, Storage and Handling of Liquified Petroleum Gases
(k) NFPA 54, National Fuel Gas Code
(l) NFPA 51, Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding Cutting and Allied Processes

1. Purpose. This chapter provides general fire prevention regulations for the safe storage, handling, and use of flammable-compressed gas and gas cylinders.

2. Scope. The scope of this chapter is intended to supplement other Shipyard instructions pertaining to the safe use of compressed gases contained in references (a), through (d), and to provide specific fire prevention regulations regarding the storage, handling, and use of flammable-compressed gases contained in references (e) through (l).

3. Introduction

a. The hazards of flammable gas are generally similar to that of flammable liquids, except that flammable gases are already in a physical state in which they can be readily ignited.

b. The safety requirements for storage, handling, and use of flammable gases are: substantial piping systems; proper storage; cylinders free of leaks; and the safe handling of compressed gas cylinders.

4. Definitions

a. Compressed Gas. Any material or mixture having in the cylinder an absolute pressure exceeding 40 pounds per square inch at 70°F, or having an absolute pressure exceeding 104 pounds per square inch at 130°F, or any flammable material having a vapor pressure exceeding 40-pounds per square inch absolute at 100°F.

b. Cryogenic Gas. A liquified gas that is maintained below its boiling point, below -150°C.

c. Flammable Compressed Gas. Any gas with a flammable limit below 13 percent in air, or a flammable range greater than 12 percentage points. Common flammable-compressed gases found in the Shipyard include hydrogen, acetylene, propane, and MAPP gas.

d. Liquified Compressed Gas. A gas that at 70°F, inside its closed cylinder, exists partly in the liquid state.

e. Liquified Petroleum Gas (LPG). Materials which are composed predominately of the following hydrocarbons or mixtures of them: propane, propylene, and butane.

f. Inert Gas. Gases that will not support combustion and because of their tendency to displace oxygen, do not support life. Typical inert gases found in the Shipyard include nitrogen, carbon dioxide, and argon.

5. Policy

a. Handling Flammable Compressed Gas Cylinders

(1) Flammable-compressed gases shall be handled and used only by properly trained personnel.

(2) Compressed gas cylinders in service and in storage shall be adequately secured to prevent cylinders from falling or being knocked over.

(3) Cylinders shall not be used as rollers, supports, or for any other purpose other than what it was intended.

(4) Where removable caps are provided for valve protection, the user shall keep such caps on cylinders at all times except when cylinders are connected to dispensing equipment.

(5) Cylinder valves shall be kept closed at all times, whether empty or full, except when the cylinder is in use.

(6) Cylinder identification shall be in accordance with reference (e).

(7) Changing, modifying, tampering with, obstructing, or repairing cylinders, cylinder valves, or the pressure relief device in cylinder valves is strictly prohibited.

(8) Compressed-gas cylinders shall not be subjected to an atmospheric temperature above 130°F. Flame shall not be permitted to come into contact with any part of the cylinder. Cylinders shall be kept far enough away from welding or cutting operations so that sparks, hot slag, or flame will not reach them, or fire resistant shields shall be provided. Regulators, and hoses shall also be protected from burning slag or embers. Cylinders and valves shall be protected from falling debris in the work area that may damage the cylinder, valve, regulator, or hoses.

(9) Leaks from cylinders which cannot be remedied by tightening a valve gland or packing nut shall be secured, tagged, and removed from service as unserviceable. Leaking flammable gas cylinders shall be kept away from sources of ignition and the leaking container removed outdoors to a well ventilated area.

(10) Cylinders and valves that are severely corroded, or any other damage noted which might impair the safe use of the cylinder shall be secured, tagged, and removed from service.

(11) A hammer or wrench shall not be used to open cylinder valves if valves cannot be opened by hand.

(12) Cylinders, valves, couplings, regulators, hoses and apparatus shall be kept free from oil or greasy substances

(13) Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. The valve shall be opened while standing to one side. Never crack a flammable compressed gas cylinder valve near other welding or other sources of ignition.

(14) Connections to piping, regulators, and other appliances shall be kept tight to prevent leakage.

(15) Before a regulator is removed from a cylinder valve, the valve shall be closed and the gas released from the regulator.

(16) Where a special wrench is required to open a cylinder valve, it shall be left in position on the stem of the valve so that it can be quickly turned off in case of an emergency.

(17) Compressed gas shall not be used to dust off clothing. This may cause serious injury or create a fire hazard.

b. Moving and Lifting Cylinders

(1) Caps shall not be used for lifting cylinders.

(2) Magnets shall not be used for lifting cylinders.

(3) When transporting cylinders by crane, specially constructed cradles or industrial gas-ready service containers shall be used. Ropes, chains, pallets, or slings shall not be used to lift cylinders.

(4) Cylinders shall not be rolled, dragged, or slid. Cylinders shall be either moved with a suitable hand truck or tilted from the vertical position and rolled on their bottom edge.

(5) Cylinders shall not be dropped or permitted to strike against each other or other surfaces.

(6) When cylinders are transported by vehicle, they shall be secured in position.

(7) Acetylene cylinders shall always be secured in an upright position except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

c. Flammable Compressed Gas Cylinders Aboard Ship

(1) Shipyard flammable-gas cylinders aboard ship shall be minimized. When circumstances allow, locate supply on the pier, and furnish gases from a header to manifolds on the ship.

(2) Cylinders and manifolds will not be placed in compartments aboard a ship but will be located on or above the weather deck in an area open to the atmosphere where gas from a possible manifold leak will be easily dispersed.

(3) When gas cylinders are required to be placed aboard ship, limit the number to those actually being used and rigged with gauges and hose. To allow personnel to replenish their gas supply, additional gas cylinders, not to exceed one-half the number of in-use cylinders required to meet peak workload demands, may be located in a remote area on the ship's weather decks.

(4) Cylinders shall be stored in the upright position in containers or stands with chains. When not in use, gas cylinders shall have lines disconnected at the source of the supply, with protective cap in place. The discharge end of the hose shall be removed from below decks or enclosed spaces.

d. Storage Requirements of Flammable Compressed Gases

(1) Storage Inside of Buildings

(a) Storage of compressed flammable gas cylinders inside shop industrial buildings, except those in use or those attached for use, shall be limited to:

1. Acetylene - 2000 cubic feet (nine cylinders) or

2. Propane - 309 pounds (three cylinders)

3. MAPP - 368 pounds (two large or five medium cylinders) or

4. Hydrogen - 2000 cubic feet

(b) Cylinders shall be kept away from radiators and other sources of heat. Cylinders must not be stored in areas where the temperature can exceed 130°F.

(c) Acetylene cylinders shall be stored and used valve end up.

(d) Cylinders shall be stored in a well protected, well ventilated, dry location, at least 20 feet from highly combustible materials and not near arcing electrical equipment, open flames, or other ignition sources.

(e) Cylinders shall be stored in assigned places, away from elevators, stairs, gangways, or areas normally used for the safe exit of personnel. Assigned storage spaces shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering by unauthorized personnel. Cylinders shall not be kept in unventilated enclosures such as lockers or cupboards.

(f) Where gases of different types are stored in the same location, cylinders shall be grouped by type of gas. Full and empty cylinders shall be stored separately, but are to be treated the same as full cylinders.

(g) Cylinder storage areas shall be prominently posted with the name of the gas stored.

(h) Cylinders that are palletized vertically for storage must also be strapped.

(i) Smoking is prohibited within 50 feet of flammable compressed gas storage areas. "No Smoking" signs shall be posted around the storage area of buildings, or at the entrance to special storage rooms.

(2) Outdoor Storage of Cylinders

(a) Cylinders in storage shall be protected from the elements. Charged cylinders should be given priority for available covered storage.

(b) When the ambient temperature reaches 90°F, all charged high-pressure gas cylinders shall be shielded from the direct rays of the sun to prevent over pressuring of the cylinders.

e. Fixed Pipe Gas Systems

(1) Installation of fuel gas piping systems shall be in accordance with reference (k), except that LP-Gas piping systems shall be in accordance with reference (i).

(2) Installation of Oxygen-Fuel gas piping systems shall be in accordance with reference (l).

(3) Repairs, alterations, or modifications to building systems or connections to the system shall be accomplished by Facilities and Maintenance Personnel. Equipment to be connected to the system will be inspected by Facilities and Maintenance personnel prior to its connection. System piping shall be tested for leaks prior to charging system. Where equipment is of a type designed for portable use, it will be inspected on initial operation and at least annually thereafter. An inspection tag (metal disk, with assigned number, and date of inspection) will be affixed to the portable equipment.

(4) Damage to lines and equipment utilizing gas, or gas leaks shall be immediately reported to Facilities and Maintenance Department (Code 910) and the Fire Division.

(5) All gas services to buildings must be provided with shut-off valves located outside of the building.

(6) Gas-burning appliances shall be rigidly supported and supplied by fixed piping. If flexible tubing is used, it must be of an approved type with a shut-off valve required on the rigid pipe.

f. Characteristics and Specific Safety Precautions of Compressed Gases Common to the Shipyard

(1) Acetylene is highly flammable, and when mixed with air, is highly explosive. The cylinders shall be used and stored in an upright position in a well ventilated area. Sparks and flame must be kept away from cylinders, and acetylene must never be allowed to escape into an enclosed area. Acetylene, in moderate concentrations, may act as an intoxicant. In higher concentrations, it will cause unconsciousness, and ultimately asphyxiation. Breathing of acetylene gas in any concentration must be avoided.

(2) Argon is nonflammable and nontoxic, and will not support combustion. High concentrations in a confined area may displace oxygen and cause suffocation.

(3) Carbon Dioxide is much heavier than air. It is nonflammable and does not support combustion. High concentrations in a confined area will displace oxygen and cause suffocation.

(4) Chloro/Fluoro-hydrocarbons are various refrigerant gases which are heavier than air, are nonflammable, do not support combustion, and are considered relatively nontoxic. However, prolonged breathing of moderate concentrations can irritate the nose and throat, and may produce lethargy. High concentrations in a confined area can displace oxygen and cause suffocation.

(5) Chlorine is a greenish-yellow gas that is much heavier than air and is not combustible. It reacts rapidly with many substances, and may cause fire or explosion. Chlorine must be stored in a well ventilated area away from flammable liquids and gases or other substances that are easily ignited. In light concentrations, chlorine gas will irritate the eyes, nose, throat, lungs, and skin. Heavier concentrations will cause severe damage to the respiratory tract. Liquid chlorine can cause severe burns on contact.

(6) Hydrogen is a colorless, odorless, and tasteless, lighter than air gas. It is nontoxic, but can cause asphyxiation by displacing oxygen in confined spaces. Hydrogen has an ignition temperature of 752°F. and a flammable range of 4.0 to 74 percent by volume with air. Due to its low ignition temperature, rather small heat-producing sources (e.g., friction and static electricity) often result in prompt ignition. It is for this reason hydrogen is thought of as "self-igniting." All personnel receiving, handling, or storing hydrogen gases shall comply with the following requirements:

(a) Due to the high ignition potential of hydrogen, extreme care shall be taken at all times to prevent all sources of ignition in the vicinity of stored cylinders. There shall be no smoking within 30 feet. Warning signs shall be posted in the vicinity of cylinders which shall state, "Hydrogen, Flammable Gas, No Smoking, No Open Flames."

(b) Shipyard's hydrogen cylinders shall not be brought aboard ship until their actual use is pending, and shall be removed immediately on completion of the job. Cylinders shall be stored top-side in designated areas, secured from falling and/or mechanical damage. Unused cylinders shall be returned promptly to a designated hydrogen storage facility, as determined by the Supply Department.

(c) Ship's hydrogen cylinders not required for reactor operations shall be stored during overhaul at a designated hydrogen storage facility, as determined by the Supply Department.

(d) Fire involving hydrogen cylinders is best controlled by shutting off the gas flow. Cylinders should be cooled with water fog to prevent overheating and the cylinder isolated as much as possible. The flame should not be extinguished unless gas flow can be halted. Caution shall be used when approaching a hydrogen fire as the flame is often invisible in daylight and heat production is at a low level. A broom or similar object held in front of the person approaching a hydrogen fire is an effective tool.

(7) Liquified Petroleum Gases such as butane and propane are flammable and must not be stored with oxygen or flammable substances. These gases are relatively nontoxic, but may act as an anesthetic. They are heavier than air. Standards and codes severely restrict the uses of liquid-phase LPG indoors. LPG presents both combustion explosion and fire hazards when released from containment. When liquid-phase LPG is used indoors, the combustion explosion experience is common. This is primarily related to the fact that if one gallon of liquid propane is released from its container it will produce approximately 270-

gallons of gas. If released inside a building, the relatively low but narrow flammable limits (2.15-9.6), specific gravity (1.5-2.0), and this tremendous liquid to vapor expansion, most often leads to a combustion explosion.

(a) Location of LPG Containers and Appliances

1. Containers of LPG shall be located outside of buildings.

2. The use of LPG containers and appliances in buildings is prohibited without written authorization by the Fire Division.

(b) Marking of Containers

1. When LP-Gas, and one or more other gases are stored or used in the same area, the containers shall be marked to identify their content. They shall be marked "Flammable" and either "LP-Gas," "Propane," or "Butane."

2. A warning label shall be applied to all portable refillable LP-Gas cylinders of 100-lb LP-Gas capacity or less. The label shall include information on the potential hazards of LP-Gas.

(c) Industrial (and Forklift) Trucks Powered by LP-Gas

1. Trucks with permanently mounted containers shall be refueled outdoors.

2. Removable LP-Gas containers shall not be exchanged and LP-Gas powered vehicles shall not be parked near sources of heat, open flames, or similar sources of ignition.

3. LP-Gas fueled industrial trucks shall be permitted to be used in buildings if:

a. The total water capacity of the fuel containers does not exceed 45-lb LP-Gas capacity.

b. The service valve of the fuel container shall be closed whenever vehicles are parked overnight or stored for protracted periods of time indoors.

(d) Marking of Vehicles Powered by LP-GAS. All vehicles, including general purpose and industrial trucks (and forklifts) powered by LP-Gas shall be identified with a diamond shape label located on an exterior vertical surface on the lower right rear of the vehicle. The label shall be approximately 4-3/4

in. long by 3-1/4 In. high. The marking shall consist of a border and the letters "PROPANE" (1 in. minimum height centered in the diamond) of silver or white reflective luminous material on a black background (See Exhibit V-2-1).

Exhibit V-2-1

(e) Vehicles With LP-Gas Engine Fuel Systems shall be permitted to be stored or serviced inside garages, provided:

1. The fuel system is leak free.

2. The container shut-off valve is closed.

3. The vehicle is not parked near sources of heat, open flames, or similar sources of ignition, or near inadequately ventilated pits.

(8) MAPP (Methyl-Acetylene-Propadiene-Propylene) Gas is similar to propane in flammability with toxic properties similar to acetylene. Its strong characteristic odor can usually be detected at levels well below the point at which they become dangerous.

(9) Nitrogen has the same density as air, is nonflammable and does not support combustion. High concentrations of nitrogen in a confined space can displace oxygen and cause suffocation.

(10) Oxygen is nonflammable but supports combustion intensely. It must not be stored or used near flammable materials or gases. Oil or grease must never be allowed to come into contact with oxygen cylinders, valves, regulators, gauges, or fittings. Oxygen cylinders shall not be stored near highly combustible material, especially oil and grease; or near acetylene or other flammable compressed gases; and shall be separated by a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(11) Natural Gas is produced as the result of the decomposition of organic materials by heat, pressure, and bacteriological action in the absence of air below ground. Natural gas is distributed in piping as a compressed gas at various pressures. It is a flammable, nontoxic, asphyxiant gas that, if released, presents both a combustion explosion and fire hazard. Because most use of natural gas is indoors, the combustion explosion in buildings is common.

(12) Sulfur Dioxide is nonflammable but is extremely toxic and injurious to the eyes, nose, and throat. It will irritate other moist areas of the body.

(13) Inert Gases. Inert gases, such as argon, carbon dioxide, helium, and nitrogen are simple asphyxiants which can displace the oxygen in air necessary to sustain life and can cause rapid suffocation due to oxygen deficiency. The safe use of these gases shall be in accordance with reference (d).

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Volume VI - FIRE PREVENTION AND PROTECTION REGULATIONS FOR SHIPS, BARGES, DRY DOCKS, AND PIERS

CHAPTER 1 FIRE-PROTECTION RESPONSIBILITIES FOR SHIPS, BARGES, DRY DOCKS, AND PIERS

1. Purpose. This chapter identifies command responsibilities for fire prevention and protection for ships, barges, dry docks, and piers associated with the overhaul, decommissioning, and recycling of ships at the Puget Sound Naval Shipyard.

2. Responsibility

a. Fire Chief (Code 1124)

(1) Provide for regularly scheduled fire-prevention inspections of all ships to eliminate fire hazards. Daily fire inspections shall be conducted on all nuclear ships. At a minimum, weekly inspections shall be performed on all other ships. The purpose of these inspections are to ensure temporary fire-fighting capabilities are maintained, emergency egress and access are maintained, and to monitor conditions aboard ships for the purpose of enforcing Shipyard fire regulations. Deficient conditions shall be reported to the Ship Safety Officer/Project Safety Coordinator.

(2) Provide fire-fighting assistance upon request of the ship's commanding officer in accordance with Volume 6, Chapter 2, of this manual, and established Fire Protection Memorandum of Agreements (MOA) between the Shipyard and the ship.

b. Production Resources Manager (Code 900) shall be responsible for the overall Fire Prevention Program for buildings, ships, and areas assigned to the Production Resources Department, and for the correction and reduction of hazards in accordance with good shipbuilding practices. In matters related to fire prevention and fire protection, the Production Resources Manager shall consult with the Fire Chief.

c. Operations Officer (Code 300) is responsible for ensuring that all work aboard ships assigned to the Shipyard for repair, overhaul, decommissioning, or conversion is performed in accordance with all applicable fire and safety directives and safe work practices.

(1) The Operations Officer is responsible for the assignment of Project Superintendents and Ship Safety Officers who have been trained and qualified to assume these positions.

(2) In the event of a major shipboard fire or flooding, the Operations Officer shall report to the Incident Command Post. The officer shall assume the responsibilities of the SSO and provide assistance to the Senior Fire Officer On-Scene.

d. Ship Safety Officer (SSO)/Project Safety Coordinator

(1) Conduct fire and evacuation drills.

(2) In conjunction with Fire Division, establish and maintain egress routes.

(3) Assure fire-protection equipment established in Volume VI, Chapter 5, are present and functioning.

(4) Review Fire Deficiency reports of ships and areas assigned, and ensure corrective action is taken promptly.

e. Ship's Commanding Officer

(1) All ships undergoing repair or overhaul shall comply with the fire-prevention regulations of this manual.

(2) The ship's commanding officer is responsible for the safety of the ship and the personnel onboard. These responsibilities include fire prevention and fire protection, and training of personnel under their command to include the procedures for reporting fires, fire hazards, and hazardous material spills.

(3) The ship's commanding officer shall designate a ship's representative to be the Fire Division's point-of-contact for fire safety matters under the ship's cognizance.

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CHAPTER 2 RESPONSE TO FIRES ABOARD SHIP

Ref: (a) General Specifications For Overhaul of Surface Ships, NAVSEA S9AAO-AB-GOS-010/GSO
(b) NAVSEA 0905-485-6010, Manual for the Control of Testing and Ship Conditions
(c) General Overhaul Specifications for Deep Diving Submarines, NAVSEA 0902-018-2010

1. Purpose. This chapter identifies the requirements and responsibilities for responding to fires aboard ships.

2. Policy. The response to fires aboard ship shall be in accordance with references (a) through (c), and this chapter.

a. Responsibility of the Person Discovering a Fire

(1) Anyone discovering a fire aboard ship shall notify the Casualty Control Station (CASCON) Watch, Officer of the Deck, or Ship's Watch Stander.

(a) On ships provided with a temporary fire alarm system, pull the nearest fire alarm box.

(b) On ships with the 1MC system in operation, notify the Officer of the Deck.

(c) If available, utilize telephone to dial 911 to report the fire to NESCOM.

(2) Take actions, as appropriate, without placing one's safety at risk, to assist personnel in evacuating the area, and to control or limit the spread of fire by utilizing portable fire extinguishers, and containing fire to point of origin by securing doors and hatches to the affected area.

(a) Special precautions shall be observed by all personnel handling carbon dioxide extinguishers since discharging an extinguisher in a confined, poorly ventilated space can result in a high concentration of carbon dioxide and a oxygen deficient atmosphere. Reentry will not be made into a confined space where a carbon dioxide extinguisher has been discharged or there has been a fire.

(b) Reentry to such spaces will be cleared by the Gas-Free Engineer.

b. Shipboard Workers

(1) All personnel working on board a ship shall acquaint themselves to the escape routes from their work sites.

(2) Evacuate the ship. Listen for announcements which will follow all alarms. Follow directions given by Ship's Force, Watch Stander, or Fire Division personnel regarding the evacuation of the ship.

(3) Muster with your shop supervision at a predetermined location.

(a) For ships in dry dock, personnel shall assemble on top of the dry dock at the northwest corner.

(b) For ships pier side, personnel shall assemble at the head of the pier at the northwest corner.

(c) If downwind smoke conditions prevent mustering at the northwest corner of the dry dock/pier, personnel shall muster at an alternate suitable location.

* (d) At the assembly point, personnel shall be accounted for by shop supervision. The supervisor, or designated representative, shall be responsible for reporting to the Senior Fire Officer On-Scene any personnel reported missing. Personnel with no supervision on the scene shall contact their supervisor and follow their instructions.

c. Responsibility of the CASCON Watch/Officer of the Deck/Ship's Watch Stander

(1) On discovery of a fire, the CASCON Watch Stander, Officer of the Deck (OOD), or ship's Watch Stander, shall sound the fire alarm and notify personnel on board using the ship's general or temporary public announcing system.

(a) Notify the Fire Division by activating the fire alarm box located at the ship's CASCON or quarterdeck.

(b) Immediately follow up the activation of the fire alarm box by calling 911 to assure that notification has been received and to provide NESCOM with additional information about the fire.

(c) Continue to pass information concerning the emergency over the CASCON announcing system as the emergency progresses.

d. Ship's Force Responsibility

(1) Commanding officers of commissioned ships are assigned responsibility for fire protection of ships in commission, undergoing repair or overhaul. The Shipyard shall provide fire-fighting assistance upon request of the ship's commanding officer. Fire-protection services shall be provided in accordance with this instruction and established Fire Protection Memorandum of Agreements (MOA) between the Shipyard and the ship.

(2) On arrival of the Senior Fire Officer, the OOD shall provide a summary of the situation and the actions taken. Communications between the ship and the Shipyard Fire Division shall be maintained throughout the emergency.

(3) On request, the OOD shall provide Fire Division personnel with qualified escorts to assist Fire Division personnel to the fire scene.

(4) Ship's Force fire-fighting activities shall not impede the evacuation of Shipyard employees attempting to egress the ship.

(5) Ship's Force is responsible for setting fire zones.

(6) For investigative purposes, Ship's Force shall provide access to the fire scene and provide information regarding the cause and origin of the fire to the Fire Division.

e. Fire Division, Code 1124

(1) The Senior Fire Officer On-Scene shall report to the ship's CASCON or quarterdeck.

(2) On fires aboard commissioned ships, the Senior Fire Officer shall report to the Command Duty Officer and indicate their readiness to assist as directed.

(a) Fire-fighting operations shall be under the supervision of the ship's Command Duty Officer. The Shipyard Senior Fire Officer shall maintain direct supervision and responsibility for the safety of their personnel.

(b) The Shipyard Senior Fire Officer shall provide recommendations to the Command Duty Officer regarding fire-fighting operations.

(3) On fires aboard decommissioned ships, the Senior Fire Officer On-Scene shall assume command as provided for in Volume II, Chapter 2, paragraph 5a(9) of this manual.

f. The Incident Command Post. For fire fighting or other emergency purposes, the ship's CASCON/Quarterdeck or Watch Stander's booth will be considered as a command post for directing operations in shipboard fires or emergencies. When there is no CASCON/Quarterdeck or ship's Watch Stander's booth, the forward gangway will be considered the command post, or at a location selected due to circumstances by the Senior Fire Officer On-Scene. All personnel and support dispatched or summoned to the scene shall report to the incident command post.

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CHAPTER 3 EMERGENCY EGRESS ABOARD SHIPS IN OVERHAUL

Ref: (a) General Specifications For Overhaul of Surface Ships, NAVSEA S9AAO-AB-GOS-010/GSO
(b) NAVSEA 0905-485-6010, Manual for the Control of Testing and Ship Conditions
(c) General Overhaul Specifications for Deep Diving Submarines, NAVSEA 0902-018-2010
(d) Title 29 Code of Federal Regulations (CFR) 1915.52

1. Purpose. This chapter establishes the minimum requirements for emergency egress from ships and shall apply to all availabilities.

2. Policy. The emergency egress from ships in overhaul shall be in accordance with references (a) through (d), and this chapter.

a. General

(1) The Ship's Safety Officer/Project Safety Coordinator shall designate escape routes.

(2) Means of egress from the ship shall be provided in sufficient number to permit rapid egress, under emergency conditions, of all personnel aboard.

(3) The way of exit travel within the ship shall be kept clear at all times. Free access shall be maintained to all exits and to all fire alarm boxes and fire extinguishing equipment.

(a) Adequate aisles and passageways shall be maintained and kept clear of obstructions.

(b) Service leads and equipment shall not be permitted to obstruct paths of emergency egress or access by emergency response personnel. Rigging of hoses, welding leads, temporary lights, ventilation, and other equipment shall be kept clear of the decks, on temporary trees or brackets, and be arranged to minimize tripping.

(4) Emergency lighting shall be provided along the routes of egress independent of either shore power or ship's normal lighting systems.

(5) Routes of egress shall be clearly marked. Exit signs and directional arrows shall be provided to indicate primary and secondary means of egress.

(6) The minimum width of gangways and other means of egress from the ship shall be 36 inches.

(7) Brows, gangways, and ramps shall be maintained free of debris, ice, snow, and other foreign matter.

(8) All personnel working onboard a ship shall acquaint themselves to the escape routes from their work sites.

b. Surface Ships

(1) Provide one gangway at the ship's quarterdeck, one forward, and one aft.

(2) On ships with three or less accesses to each machinery space, a minimum of one shall remain unobstructed and maintained as a means of emergency egress.

(3) On ships with four or more accesses to each machinery space, a minimum of two shall remain unobstructed and maintained as a means of emergency egress.

(4) Headroom in walking and working areas shall permit normal operations required in the space without undue interference caused by striking objects overhead. Lighting fixtures, ventilation ducts, piping and wiring shall be installed as close to the overhead as practicable. A clear headroom of 6 feet, 5 inches is desired in all areas, but in no case shall clear headroom be less than 6 feet, 3 inches. Where such installations cannot be avoided, guards or protective padding shall be provided.

c. Submarines. At least two separate and remote means of egress from the ship shall be provided.

d. Fire Bills for Ships

(1) Shop 64 will prepare and install Fire Bills on all ships aboard which Shipyard personnel are working.

(2) The Fire Bill shall indicate fire and evacuation signals, evacuation instructions, and the proper procedure for sounding the alarm. Emergency telephone numbers for Fire and Medical, Police, and Radiological Control shall also be provided.

(3) Fire Bills shall be posted at the foot of the gangway. On larger ships, the Fire Bill shall be posted at two gangways.

* e. Evacuation Drills. In order to acquaint Shipyard employees working aboard ship with evacuation procedures, the Fire Division in conjunction with the Ship Safety Officer/Project Safety Coordinator shall conduct a quarterly evacuation drill. The drill may be conducted in conjunction with required shipboard fire drills provided the evacuation of the ship, or portion thereof, is a requirement of the drill plan.

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CHAPTER 4 FIRE DRILL REQUIREMENTS FOR SHIPS IN OVERHAUL

Ref: (a) General Specifications For Overhaul of Surface Ships, NAVSEA S9AAO-AB-GOS-010/GSO
(b) NAVSEA 0905-485-6010, Manual for the Control of Testing and Ship Conditions
(c) General Overhaul Specifications for Deep Diving Submarines, NAVSEA 0902-018-2010

1. Purpose. This chapter establishes the requirements for and responsibility to conduct fire drills required by references (a) through (c). Reference (a) requires Shipyard fire regulations to provide preplanning for a probable fire aboard ship. This includes the responsibility to ensure that fire drills are conducted which involve Ship's Force and the Shipyard Fire Division.

2. Scope. The requirements of this chapter pertain to conducting fire drills aboard all surface ships and submarines, where reference (a) or (b) is invoked, undergoing an industrial availability in the Shipyard.

3. Policy

a. Ship Safety Officer (SSO) shall be responsible for the planning and scheduling of fire drills to include the responsibility to:

(1) Provide a drill audit plan, in accordance with paragraph h of this chapter, in which the drill attributes are concurred upon by participating organizations, and receive concurrence to conduct the drill from organizations that may be adversely impacted by the drill.

(2) Conduct a pre-drill meeting with cognizant organizations to provide an opportunity for concurrence with the drill plan, and to issue drill observer assignments.

(3) Conduct a post-drill critique within two-working days of the drill to discuss drill performance, address deficiencies, and issue corrective actions.

(4) Publish critique minutes which include corrective actions assigned.

b. Nuclear Ship Superintendent, in coordination with the Ship Safety Officer, shall be responsible for planning, scheduling, and coordination of the required fire drill in the reactor compartment. Responsibility shall include the items listed in paragraph 3a(1) through (4) of this chapter.

c. Code 333 shall maintain files of all drill plans, critique minutes, deficient conditions, and actions taken to correct deficient conditions.

d. Shops and Codes

(1) If dispatched or summoned to drills, shall respond and report to the incident command post.

(2) If assigned action on fire drill critique reports, submit a formal reply identifying the corrective actions taken to Code 333 within ten working days of the deficiency's receipt.

e. General Requirements for Shipboard Fire Drills

(1) For scheduling purposes, drills shall be coordinated with the Fire Division at least two weeks in advance.

(2) Drills shall be conducted which evaluate the adequacy of the response of the Fire Division and the ship, communications and coordination between the Shipyard Fire Division, Ship's Force, and support organizations, and the evacuation of Shipyard personnel.

(3) Drills shall provide for the participation of the Fire Division, to the maximum extent practicable, provided that participation does not impair the ability to respond to an actual emergency.

(4) To prevent the inadvertent discharging or rupture of charged fire-fighting hose lines, hose lines entering the ship shall not be charged.

(5) Concurrence from Nuclear Engineering and Planning Codes and Radiological Control shall be obtained for drills which require entering or exiting radiologically controlled areas or involve radioactive materials.

(6) The Chief Refueling Engineer will be notified to ensure refueling operations will not be adversely affected.

(7) If in the opinion of the ship or the Shipyard the drill is unsatisfactory, a follow-up drill will be conducted.

f. Fire Drills Aboard Submarines

(1) Fire drills shall be conducted every 90 days aboard submarines undergoing an industrial availability.

(2) Once within the availability, and within the first three months of the availability, a fire drill shall be conducted in the reactor compartment.

g. Fire Drills Aboard Surface Ships. A fire drill involving Ship's Force and the Shipyard Fire Division shall be conducted early in the availability of all surface ships undergoing an industrial availability.

h. Fire Drill Audit Plan. The following attributes shall be addressed in conducting fire drills aboard ships:

(1) Time drill commence.

(2) Did the Ship Safety Watch (SSW) properly initiate alarms, voice announcements, and telephone calls?

(3) Time Fire Division arrived.

(4) Did the Fire Division receive adequate direction/information from Ship's Force?

(5) Time Shop 99 emergency personnel arrived.

(6) Did Shop 99 have proper equipment available?

(7) Was Fire Division action appropriate and expedient?

(8) Were reports, status announcements, and general communications adequate?

(9) Was Shipyard-provided damage control equipment available and in good working condition?

(10) Did emergency and/or normal communications and alarm systems work properly?

(11) Did Shipyard workers respond properly to alarms and announcements?

(12) Was the Emergency Fire and Flooding Status Bill, Ship-Plan-of-the-Day/Fire Zone Integrity Status Bill correct and up to date?

(13) Was the proper extinguishing agent utilized to fight fire (i.e., fresh water, saltwater, CO2, foam, chemical, etc.)?

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CHAPTER 5 SHIPYARD FIRE FIGHTING AND EMERGENCY EQUIPMENT REQUIREMENTS

Ref: (a) NAVSEA 0902-018-2010 General Overhaul Specifications for Deep Diving SSBN/SSN Submarines
(b) NAVSEA S9AAO-AB-GOS-010/GSO General Specifications for Overhaul of Surface Ships
(c) NAVSEA 0905-485-6010 Manual for the Control of Testing and Ship Conditions
(d) NAVSHIPYDPUGETINST P5100.70C, Ship Safety Manual
(e) NAVSHIPYDPUGETINST P11320.2, Fire Prevention and Protection for Radioactive Material Storage Areas, Radiologically Controlled Areas, Nuclear Ships and Submarines

1. Purpose. This chapter identifies fire protection and fire prevention equipment requirements for ships in overhaul.

2. Scope. The requirements of this chapter apply to all ships and shall apply to all availabilities. Requirements of references (a) through (c) established for commissioned ships are identified.

3. Policy. The Ship Safety Officer/Project Safety Coordinator are responsible to ensure that all required fire fighting equipment is in its proper location and in operational condition. The following fire fighting equipment is required for shipboard fire prevention and shall be installed at the earliest practicable date. Hot work or other hazardous operations shall not be permitted until all applicable requirements of this chapter have been met.

a. Casualty Control Station (CASCON)

(1) Surface Ships shall have a CASCON station. On active ships, the ship's Damage Control Central (DCC) may be utilized. If work renders DCC inoperable, another space or temporary enclosure will be provided on or immediately adjacent to the ship. Placement of the temporary CASCON station shall have the concurrence of the SSO/Project Safety Coordinator, Damage Control Assistant, and the Fire Division. CASCON stations shall be equipped in accordance with reference (d).

(2) Submarines shall have a CASCON station. Placement of the CASCON station shall be on or immediately adjacent to the ship. Placement of the CASCON station shall have the concurrence of the SSO/Project Safety Coordinator and the Fire Division. CASCON stations shall be equipped in accordance with reference (d).

b. Alarm Systems

(1) Surface Ships

(a) Shop 07 shall provide a master fire alarm box at the ship's quarterdeck or at a location specified by the Fire Division. The master fire alarm box shall be connected to the Shipyard fire alarm system which shall be monitored by NESCOM.

(b) A telephone shall be placed at the quarterdeck as an additional means of reporting fires.

(c) For ships without an operational damage-control communication system, Shop 99 shall provide a temporary system capable of passing alarms and announcements throughout the ship.

(d) For ships without an operational damage-control center, Shop 99 shall provide a temporary fire alarm system connected to the master control panel and master fire alarm box at the CASCON station. The location of the auxiliary fire alarm boxes shall be determined by the Fire Division and the SSO.

(e) While in dry dock, Shop 99 shall provide a minimum of three additional auxiliary fire alarm stations in the dry dock to be located at the paint kitchen, one forward, and one aft, and at other locations specified by the Fire Division. Auxiliary fire alarm stations shall be connected to the ship's master fire alarm box, or as specified by the Fire Division.

(2) Submarines. Alarm systems shall be provided for reporting fires, warning personnel to cease hot work operations, and for the evacuation of the ship. The ship's installed alarm and announcing systems, if operational, may be used for these purposes. All alarm signals shall provide a distinctive signal, which can be heard above ship construction noise throughout the ship. A telephone shall be placed at the casualty control station as an additional means of reporting emergencies.

(a) Alarm System For Reporting Fire

1. Shop 07 shall provide a master fire alarm box at the ship's casualty control station or at a location specified by the Fire Division. The master fire alarm box shall be connected to the Shipyard fire alarm system which terminates at NESCOM.

2. Shop 99 shall provide an adequate number of auxiliary fire alarm boxes, properly marked and designated with indicator lights. The number and placement of auxiliary fire alarm boxes aboard commissioned ships will be provided in each compartment and not more that 50 feet from any point in the

compartment. The number and placement of auxiliary alarm boxes aboard decommissioned ships shall be as directed by the Fire Division and the Project Safety Coordinator.

3. Shop 90E shall provide an annunciator panel with sufficient zones to provide an indication of the activation of each auxiliary alarm box installed. The annunciator panel shall be located in the casualty control station and be connected to the master fire alarm box provided by Shop 07.

4. The activation of each auxiliary fire alarm box shall produce a signal distinct from the stop hot work operations and evacuation signal.

5. Auxiliary fire alarm boxes will be of the type that have a protective lift cover to prevent accidental activation.

6. The circuit will be a yellow wire, hardwired into the pull station, and connected directly to the annunciator panel with a minimum number of connections in between. This wire will be tagged and marked, Fire Alarm Do Not Disconnect, at each connection and all connections will be taped to prevent accidental disconnection.

(b) Stop Hot Work Alarm System

1. Shop 90E shall provide an audible alarm system to instruct personnel to stop hot work operations.

2. The alarm provided shall be actuated from the CASCON station and shall produce a signal distinct from the fire alarm and evacuation signal.

(c) Evacuation Alarm System

1. Shop 90E shall provide an audible and visible alarm system to instruct personnel to evacuate the ship.

2. The alarm provided shall be actuated from the CASCON station and shall produce a signal distinct from the fire alarm and stop hot work signal.

3. A minimum of two evacuation horns shall be provided in the dry dock.

(d) Public Address System. Shop 90E shall provide a public address system with adequate speaker coverage. This system is to be located in the casualty control station and shall be used by the CASCON watch stander after sounding the alarm to indicate the nature of the emergency and to provide follow-up instructions.

(3) Installation, Testing, and Maintenance of Temporary Fire Alarm Systems

* (a) When temporary fire alarm systems are disabled for maintenance or impaired, hot work operations shall not be permitted in effected areas.

* (a) When a system is disabled where it will not sound an evacuation alarm or will not annunciate to a continuously monitored location, i.e., NESCOM or CASCON, personnel will:

* 1. Prior to disabling the system, the CASCON it is connected to and NESCOM will be notified and hot work will be secured for the effected area.

* 2. Upon determination that a system is impaired due to a malfunction of the alarm system, the CASCON it is connected to and NESCOM will be notified immediately and hot work will be secured for the effected area.

* (b) The requesting party for auxiliaries to be disconnected from a fire alarm box are responsible for the notification to the CASCON they are connected to. CASCON will be provided with accurate information as to what systems are off-line and what areas are effected.

(c) Shop 07 will be responsible for the installation of the master fire alarm box with the proper code wheel and shore service cables. Distinctive yellow colored cables will be used for shore connection. Shop 07 will make all connections to the Shipyard fire alarm circuit and test the master box to ensure proper operation. Upon removal of the master box, Shop 07 will restore continuity of Shipyard fire alarm circuit at shore connection box and test circuit.

1. When fire alarm boxes are taken out of service they shall be immediately removed or covered so personnel in need of an emergency response are assured of proper activation of the emergency fire alarm system.

* 2. When fire alarm boxes or auxiliaries connected to fire alarm boxes are disconnected (except for emergency trouble shooting of the 100 milli-amp Shipyard circuits), NESCOM and the CASCON they are connected to will be notified. Notification must be made prior to taking the system off-line if possible, or as expediently as the situation permits after. NESCOM and CASCON will be provided with accurate information as to what systems are off-line and what areas are effected.

(e) Shop 99 shall be responsible for the installation, maintenance, and repair of temporary alarm and public address systems for reporting fires, for warning personnel to cease all hot work operations, and for evacuating the ship. Responsibility shall include all components of the system, from the auxiliary fire alarm box to and including the annunciator panel at the CASCON station, and the wire of sufficient length to hook into the master fire alarm box with a normally closed (NC) circuit. Shop 99 will inform the Fire Division promptly of any changes in the ship's temporary alarm system (i.e., installation progress changes, section additions or removals, system failures, etc.).

1. When auxiliary fire alarm boxes are taken out of service they shall be immediately removed or covered so personnel in need of an emergency response are assured of proper activation of the emergency fire alarm system.

2. When auxiliaries are disconnected or disabled the CASCON they are connected to will be notified. Notification must be made prior to taking the system off-line if possible, or as expediently as the situation permits after.

* (f) N321 shall test the master fire alarm box and all auxiliary fire alarm boxes aboard active nuclear-powered ships once a quarter to ensure proper operation. Auxiliary fire alarm boxes aboard inactive submarines shall be tested randomly, at least one a quarter. All discrepancies will be recorded on the Quarterly Inspection and Test of Fire Alarm Boxes form, PSNS 11320/57 (10-87). Deficiencies shall be submitted to the appropriate shop and repaired as soon as possible. All other ship's master fire alarm boxes shall be tested on a quarterly basis.

(g) Ship's Force and Ship's Watch Standers. At 0900 daily, the Ship Safety Watch (SSW)/CASCON Watch shall conduct an operational test of the fire, stop hot work, ship's evacuation alarms, and public address system. The test will be documented in the Ship Safety Log. Deficiencies noted during testing will be reported and repaired promptly.

c. Fire Mains and Fire Hose Stations. Fresh water supply requirements for areas adjacent to controlled machinery spaces shall be in accordance with Chapter 5, paragraph 2b(2), of reference (e).

(1) Surface Ships

(a) The ship's fire main system shall be maintained in as ready-for-use condition as possible during the overhaul. Work shall be planned and executed in a manner that minimizes the outage of the ship's fire main system.

(d) When a ship's fire main system is not operational, Shop 99 shall install a temporary system as per reference (b).

(4) Submarines

(a) Shop 99 will install and maintain fire hose stations.

(b) A minimum of four fire hose stations in the dry dock, and two topside shall be provided. Hose stations shall be 150 to 200 feet apart, in a staggered manner, port from starboard, to allow overlaps between stations so that all parts of the ship can be reached by at least two 1 1/2-inch hose lines of at least 150 feet in length. Large ships may require additional stations, for adequate coverage, and will be provided when directed by Code 1124.

(c) Hoses shall be equipped with 1 1/2-inch combination straight stream and spray pattern nozzles having a capacity of 60 gallons per minute at 100 psi.

(d) Each hose station will include two carbon dioxide fire extinguishers; two spanner wrenches on 4-foot, 1/8-inch cable; and a minimum of 150 feet of 1 1/2-inch fire hose.

(e) Hose stations shall be kept clear and accessible. The hose station cabinets shall be marked with 4-inch letters of contrasting foreground and background stating, "FIRE HOSE STATION - FOR FIRE FIGHTING ONLY."

(f) Fire hose stations may be used by the Fire Division or Ship's Force for training purposes. Hose will be restored to ready status when training is completed.

(5) General

(a) Shop 99 shall immediately inform the Fire Division of any changes in the ship's temporary fire main system.

* (b) Supply valves will be maintained in the fully open position. Lock all Fire Hose Stations' supply valves, with the exception of the last in-line valve inside the hose station, in the open position by attaching nylon straps through the valve handle and around the valve body in such a way that the nylon straps will have to be broken or cut to allow the valve to be closed. Each valve tag will be identified in the comments section with the words "FIRE HOSE STATION."

(b) Freeze protection shall be provided for all fire fighting hose lines.

c. Portable Fire Extinguishers

(1) Portable fire extinguishers shall be installed by Shop 99 on ships, including all temporary shops placed aboard ship, on piers, dry docks, barges assigned to overhaul work, and living barges.

(a) On piers and around dry docks, extinguishers shall be placed in extinguisher stands to provide for a maximum travel distance of 75 feet. Extinguishers shall be located providing accessibility and protection from damage.

(b) Aboard submarines, extinguishers shall be installed so that the maximum travel distance to an extinguisher from any interior point of the ship on the same level shall not be more than 50 feet.

(c) Prior to issue, Shop 99 shall inspect, weigh, ensure hydrostatic tests are within 5 years, and identify portable fire extinguishers issued for fire fighting only with a white dot painted on the upper part of the cylinder. Fire watch extinguishers are identified by a blue dot painted on the upper part of the cylinder.

(d) Shop 99 shall inspect and maintain all portable fire extinguishers installed in temporary shops aboard ship, barges, on piers, and in dry docks on a monthly basis.

1. Shop 99 shall be responsible for the monthly inspection of extinguishers on piers, in dry docks, in areas surrounding dry docks, on barges assigned to overhaul work, and in temporary hose stations placed aboard ship. The inspection period will begin 1 week before the due date and shall be completed 1 week after the due date.

2. Carbon dioxide extinguishers shall be weighed biannually (February and August) or when the seal has been broken, and replaced when weight loss exceeds 10 percent of total weight.

3. Carbon dioxide extinguishers shall be hydrostatically tested every 5 years.

4. Inspection tags for extinguishers maintained by Shop 99 in dry docks, piers, hose stations, portable buildings, or areas subject to inclement weather will be a metal 5-year fire extinguisher maintenance record attached to each extinguisher that provides for monthly documentation and bears the current date of inspection.

(e) Shop 99 shall replace extinguishers in their areas of responsibility upon notification by the Fire Division or through inspections that indicate the extinguisher has been discharged, the seal has been broken, the extinguisher has been damaged, or the extinguisher is out of the current hydro date.

(2) Ship's Force shall conduct monthly visual inspections of fire extinguishers assigned aboard ships and living barges. Fire Extinguisher Inspection Record, NAVFAC 11320/2 (3-75), shall be affixed to all fire extinguishers and bear the current inspection date.

(3) Barge Maintenance (Code 340) shall conduct monthly visual inspections of fire extinguishers on all barges under their cognizance, not assigned to Ship's Force, on a monthly basis. Fire extinguisher inspection record, NAVFAC 11320/2 (3-75), shall be affixed to all fire extinguishers and bear the current date of inspection.

(a) Carbon dioxide extinguishers shall be weighed biannually (February and August) or when the seal has been broken, and replaced when weight loss exceeds 10 percent of total weight.

(b) Carbon dioxide extinguishers shall be hydrostatically tested every 5 years.

(4) Fire Division (Code 1124) shall provide oversight and enforcement of the above assigned responsibilities and procedures.

d. Emergency Egress and Lighting requirements shall be as per with Volume 6, Chapter 3.

Volume VI - FIRE PREVENTION AND PROTECTION REGULATIONS FOR SHIPS, BARGES, DRY DOCKS, AND PIERS

CHAPTER 6 SHIPS FUELING AND DEFUELING OPERATIONS

Ref: (a) NAVSHIPYDPUGETINST 10345.1H, Off-Loading Fossil Fuels From Ships in the Shipyard
(b) NAVSHIPYDPUGETINST 4710.7D, Overhaul High Risk Evolutions, Standard Prerequisite Lists
(c) NAVSHIPYDPUGETINST 10345.2M, Fueling Operations
(d) PRODRESDEPTINST 6240.1E, Oil Pollution Prevention During Fueling or Defueling Operations on Submarines
(e) PRODRESDEPTINST 6240.2C, Oil Pollution Prevention During Fueling or Defueling Operations on Surface Ships

1. Purpose. The purpose of this chapter is to provide fire prevention requirements which shall be followed during fueling and defueling operations between piers or dry docks and ships transferring combustible or flammable liquids.

2. Policy. The fueling and defueling of ships shall be in accordance with references (a) through (e), and this chapter.

a. Unless specific written engineering guidance is provided by Code 106, hot work shall not be performed on board ship or within a minimum horizontal distance of fifty feet from any hose, hose connection, or fuel-loading tanks being used for the transfer of combustible or flammable liquids.

b. A continuous ground strap shall be connected between the fuel tank and the ship. The ground strap shall remain in place until the fuel lines are disconnected.

c. Signs shall be posted at dispensing/receiving container, brows, hatches, and compartments that are affected by fueling or defueling operations. The signs shall state, "No Smoking, Hot Work, or Open Flames Within 50 Feet."

d. Ship's Force shall announce every 15 minutes the information as follows: the smoking lamp is out; no hot work or flame-producing operations are to be performed in the affected areas; and then announce boundaries of the affected areas.

e. Hose, that is topside of or entering the ship, shall be covered with a plastic sleeve with all joints taped to contain any leakage from the connections.

f. Hose connections that are not protected by plastic sleeves shall be provided with metal drip pans.

g. Personnel will be staged at dispensing/receiving tank shut-off valve and at shut-off valve on board the ship at discharge/intake end. Communications will be established before pumping is commenced via sound-powered phones or radios, and maintained throughout the operation.

h. Personnel will be staged to monitor fuel lines to detect leaks by means of a roving watch during the entire operation.

i. Upon completion of the setup requirements and before commencement of the operation, the controlling shop or code shall notify the Fire Division to inspect and verify by signature that all requirements and safety precautions have been met. Additional safety precautions may be required as the Fire Division deems necessary to ensure a safe operation.

Volume VI - FIRE PREVENTION AND PROTECTION REGULATIONS FOR SHIPS, BARGES, DRY DOCKS, AND PIERS

CHAPTER 7 GENERAL FIRE PREVENTION REGULATIONS ABOARD SHIPS IN OVERHAUL, REPAIR, DECOMMISSIONING, AND RECYCLE

Ref: (a) NAVSEA S9AA0-AB-GOS-010, General Specifications for Overhaul of Surface Ships
(b) NAVSEA 0905-485-6010, Manual for the Control of Testing and Ship Conditions
(c) NAVSEA 0902-018-2010, General Overhaul Specifications for Deep Diving Submarines
(d) NAVSHIPYDPUGETINST P5100.70D, Ship Safety Manual
(e) National Fire Protection Association (NFPA) 312, Fire Protection of Vessels During Construction, Repair, and Lay-up
(f) Industrial Process Instruction 0985-901, Hot Work Fire Safety
(g) NFPA 70, National Electric Code
(h) NFPA 701, Methods of Fire Tests for Flame-Resistant Textiles and Films
(i) Process Instruction 0985-682B, Fire Zone Boundary Integrity for Surface Ships During Shipyard Availability
(j) Title 29 Code of Federal Regulations (CFR) Part 1915.35 and 36

1. Purpose. This chapter provides general fire prevention requirements for ships undergoing an availability in the Shipyard.

2. Policy. Fire prevention regulations for ships shall be in accordance with references (a) through (j), and this chapter.

a. Good Housekeeping is essential to the reduction and severity of fires aboard ship. Particular emphasis shall be directed towards controlling ordinary combustible materials, which most readily contribute to the rapid spread of fire aboard ship.

(1) Good housekeeping shall be practiced at all times and shall include provisions for suitable receptacles for trash, continuous cleanup in all areas to avoid accumulations of combustible materials, and the immediate cleanup of any flammable liquid spill which may occur.

(2) Work areas shall be kept clean. All accumulations, and particularly combustible rubbish, refuse, and waste materials, shall be collected and safely disposed of as they accumulate.

(a) The responsible shop or Ship's Force shall ensure that adequate trash receptacles are provided in each area or space

to accommodate needs and that such containers are emptied daily or more often, as required.

(b) Supervisors of trades working on ships, piers, and dry docks shall conduct a daily end of shift cleanup. All materials shall be cleaned up and removed as they accumulate.

(c) The Project Superintendent shall assure that weekly all trade cleanups are conducted and to conduct clean up of areas not otherwise assigned.

(3) The ship and surrounding areas shall be maintained in a neat and orderly condition.

(a) Shop 02 shall check, at least twice daily, large dumpster trash containers on all piers where overhaul is in progress. Assure containers are not over-full, and that trash is not accumulating around the area.

(b) Shop 72 shall:

1. Ensure that trash and dumpster boxes are promptly emptied when full and at least once during each shift. Full trash and dumpster boxes shall not be allowed to accumulate on ships and piers.

2. Maintain fire hydrants, fire alarm boxes, and fire lanes, including turn-around points at the southern ends of piers and midway points of piers are clear of obstructions at all times.

* (4) Combustible covers commonly known as Poly-Tarps are intended to be used for short term weather protection, environmental protection, or security reasons. They are not to be used within 35' of any hot work, on temporary structures or staging on board any vessel undergoing Inactivation/RCD/Recycle, within 15 feet of such vessel, or any location where tarps could be exposed to a heat source and ignite.

b. Material Handling

(1) General

(a) Storage of material aboard ship shall be limited to that which is required for work in progress. Storage shall be located in areas that do not interfere with access to fire fighting equipment or egress of personnel.

(b) Crating and packing shall be removed prior to bringing equipment or working material aboard. If material could be

damaged during handling, crating and packing will be permitted aboard provided packing materials are removed immediately after it is brought aboard.

(2) Surface Ship

(a) The maximum piling of material shall not exceed eight feet in height where equipment and material are permitted to be placed aboard ship for temporary storage.

1. Material shall not occupy a deck space to exceed 25 square feet.

2. Between each material storage area, six-foot aisles shall be maintained on all sides to permit fire fighting access.

(b) A twenty-foot-wide lane shall be maintained the length of hanger decks to act as a fire break and serve as a means of emergency vehicle access. Yellow lines shall be painted the entire length of the hanger deck to identify the lane. The lane shall remain clear at all times.

(3) Submarine. Avoid direct contact of combustible materials with the overhead, bulkheads, and decks.

c. Smoking shall only be permitted in designated areas established by Ship's Force, the SSO/Project Safety Coordinator, and the Fire Division.

d. Shop 99 Temporary Electrical Installations

(1) Install and maintain temporary electrical wiring and equipment in a substantial manner so as to be safe from physical damage and shall be inspected frequently.

(2) Promptly repair defects in wiring, fixtures, or equipment of a type liable to create a dangerous condition.

(3) Ground and provide overcurrent protection for portable equipment. Disconnect equipment when not in use.

(4) Do not place wiring and lamps in direct contact with combustible materials.

(5) Do not use makeshift hangers, such as nails, which might damage wiring insulation.

(6) Install protective guards on all lights subject to physical damage.

(7) When temporary wiring and equipment is needed in hazardous locations, such wiring and equipment shall conform with the hazardous classification identified in Articles 500 through 503 of reference (g).

e. Fire Zone Boundaries

(1) Fire zone boundaries shall be established and maintained in accordance with reference (a).

(2) Existing transverse watertight, airtight and fume-tight bulkheads shall be used on ships built prior to the requirement for fire zones.

(3) Where ships have fire zones by design, the designated bulkheads shall be used.

(4) The fire zone boundary shall be continuous throughout the vertical extent of the ship, from keel up to flight deck on carrier-type ships and from keel up to the main deck on other ships. In case of fire on carrier-type ships, a means shall be provided to close hanger division doors.

(5) The number of fire zone boundaries shall be dependent upon the length of the ship. Ships over 600 feet long shall have a minimum of three boundaries. Ships under 600 feet shall have a minimum of two boundaries.

(6) The identification, maintenance, and penetration of fire zone boundaries shall be in accordance with reference (i).

(7) Temporary access cuts may be made in boundaries if they are provided with fumetight closures.

(8) Service lines shall not be run through boundaries unless quick disconnects are installed which permit the opening to be secured within three minutes.

f. Temporary Structures, Staging, and the Use of Combustible Materials Aboard Ship

(1) Unless absolutely necessary, temporary structures shall not be erected aboard ship. When required, temporary structures shall be constructed of fire-retardant materials.

(2) Combustible structures located on adjacent piers or barges shall be kept sufficiently clear to preclude spreading fire to the ship.

(3) The use of wood shall be minimized. Where wood is used aboard ship, or in the vicinity of the ship, it shall be fire-retardant treated in accordance with MILSPEC MIL-L-19140, Type II Treatment and Category 2 marking.

(a) Pieces cut from scaffold planking need not be remarked or rebranded.

(b) Pieces cut from plywood which are larger than one square foot shall show some part of the original mark, or shall be remarked to indicate that it is fire-retardant treated.

(4) Fireproof or fire-resistant coverings such as fire-proofed canvas, fire-resistant synthetic fabrics, noncombustible fabrics, metal covers, or other suitable materials shall be used to protect vulnerable items of machinery and equipment from falling sparks or other potential sources of fire. Combustible fabrics shall be treated and tested in accordance with reference (h) and the material marked with the symbol "FR."

(5) Mobile trailers placed in the ship's interior contribute to the fire load of the ship. Sprinkler systems shall be provided and maintained in accordance with Volume III, Chapter 6, paragraph 4 of this manual.

g. Storage of Explosives, Flammable Materials, and Other Dangerous Cargo

(1) The storage of explosive, flammable, or combustible materials aboard ships shall not be permitted.

(2) Exception is made for standard ship's stores (e.g., paints, solvents, or similar items) stowed in storage lockers equipped with fully functional carbon dioxide systems in which hot work is not programmed for the storage space or adjoining spaces where fires or heat could cause ignition of the materials.

(3) Appropriate safety precautions shall be taken prior to allowing entry or conducting hot work on tanks, piping systems, or components which have previously contained flammable liquids.

h. Flammable Liquids Aboard Ship. In addition to the applicable requirements for flammable and combustible liquid storage and use identified in Volume V, Chapter 1, the following requirements shall be adhered to:

(1) General

(a) No fuels shall be stored aboard ship.

(b) The quantity of flammable liquids shall be kept to a minimum and shall not exceed that necessary for a single day's use. Flammable liquids shall be kept in direct custody of the worker using the material. Unused flammable liquids shall be removed from the ship at the end of the work day, and stored in a suitable shore storage facility.

(c) Storage of flammable liquids shall be located sufficiently remote to ensure that fires involving these materials will not immediately spread to the ship.

* (d) Fueling of gas-powered portable equipment aboard vessels is prohibited unless authorized by Fire Department.

(2) Surface Ship

(a) Drums of flammable liquids, 55 gallons or greater, having a flash point of 150°F or less, shall not be permitted aboard ship.

(b) Flammable liquids brought aboard ship shall be kept topside in safety cans when not actually in use or left unattended, and shall be limited to one day's supply.

(c) The use of equipment-moving vehicles fueled by gasoline, propane, or other flammable gases shall be restricted aboard ship, except where no suitable alternative exists.

(d) To control flammable liquid spills, metal coamings a minimum 4 inches high, tack-welded and caulked to the deck shall be installed around all through deck access openings in the main deck.

i. Storage of Flammable Liquids in Dry Dock shall be in accordance with the applicable requirements of outdoor storage of flammable liquids identified in Volume 5, Chapter 1, paragraph 8 of this manual, and include the following specific requirements:

(1) Dry Dock areas are limited to the temporary storage of 400 gallons total storage. With the approval of the Fire Division, temporary storage not to exceed 1,000 gallons shall be permitted just prior to scheduled use and only for that time necessary to complete exterior ship application. Upon completion, removal of the material is mandatory. At no time shall this temporary storage of flammable liquids not being used due to inclimate weather or work stoppage exceed one week.

(2) Temporary storage areas shall be limited to one site per dry dock and shall not be less than 50 feet from the ship or wood staging around the ship.

(3) The perimeter of the area shall be posted with warning signs stating, "Danger Flammable Liquids, No Smoking Or Hot Work Within 50 Feet."

(4) Where structures are provided for the storage and/or mixing of paint, they shall be of noncombustible construction. Where they are located within 50 feet of the ship or 20 feet of other structures, the structure will be provided with two-hour fire-rated construction.

(5) Enclosed mixing areas shall be provided with mechanical ventilation if Class I liquids are dispensed. Ventilation shall provide a minimum of one cubic foot per minute of exhaust per square foot of floor area.

(6) At least one fire alarm station or master fire alarm box, as directed by the Fire Division, shall be provided at the nearest point of exit from the dry dock where flammable liquids are stored or mixed. The alarm shall be connected to the Shipyard Fire Alarm System and the CASCON.

(7) A fire extinguisher with a minimum UL rating of 40B shall be provided within a maximum travel distance of 30 feet. If the travel distance exceeds 30 feet, a fire extinguisher with a minimum UL rating of 80B shall be provided at the storage area.

(8) Adequate containment shall be provided for the mixing and storage of materials to prevent spills from spreading to waterways or important structures.

(9) Storage and mixing processes may occupy the same structure provided they do not exceed 1000 square feet.

j. Storage of Flammable Liquids on Piers shall be in compliance with the requirements for outdoor storage of flammable liquids provided for in Volume V, Chapter 1, paragraph 4c of this manual.

k. Flammable Compressed Gas Cylinders Aboard Ship shall be in accordance with Volume V, Chapter 2, paragraph 5c of this manual.

l. Hot Work Operations Aboard Ship. All hot work on submarines and surface ships assigned to the Puget Sound Naval Shipyard for overhaul, conversion, repair, decommissioning, recycle, or other availability shall be accomplished in accordance * with reference (f) and the following:

* (1) Authorized hot work prior to temporary fire alarm system being installed will be limited to that necessary to install the temporary fire alarm system.

Enclosure (1)

* (2) Hot work will not be permitted whenever the temporary fire alarm system is disabled or impaired.

m. Ships Fueling and Defueling Operations shall be accomplished in accordance with Volume VI, Chapter 6 of this manual.

n. Application of Paints and Other Flammable Materials. The following fire prevention precautions shall be followed for the spray application aboard ship and in dry dock of paints containing solvents with a flash point 100°F and below.

(1) Paint Mixing Areas

(a) The paint mixing area shall be located off the ship in a clearly designated area. It shall be kept clear and free of unnecessary flammable or combustible materials.

(b) The mixing area will be identified at the boundary which shall be a distance of 50 feet on all sides with a rope or barricade posted on all sides, "Danger, No Smoking or Hot Work Within 50 Feet."

(c) There shall be a minimum of two fire extinguishers with a minimum UL rating of 60B located in the immediate area.

(d) All electrical equipment shall be grounded and shall be of a type approved for Class I, Division 2 locations in accordance with reference (g).

(e) Tools shall be of nonferrous metal or equal materials.

(f) Where structures are provided for the storage and or mixing of paint, they shall be of noncombustible construction. Where they are located within 50 feet of the ship, or 20 feet of other structures, the structure will be provided with two hour fire-rated construction.

(g) Enclosed mixing areas shall be provided with mechanical ventilation if Class I liquids are dispensed. Ventilation shall provide a minimum of one cubic foot per minute of exhaust per square foot of floor area.

(h) At least one fire alarm station or master fire alarm box, as directed by the Fire Division, shall be provided at the nearest point of exit from the dry dock where flammable liquids are stored or mixed. The alarm shall be connected to the Shipyard Fire Alarm System and the CASCON.

(i) Adequate containment shall be provided for the mixing and storage of materials to prevent spills from spreading to waterways or important structures.

(j) Storage and mixing processes may occupy the same structure provided they do not exceed 1000 square feet.

(2) Painting Equipment

(a) All spray equipment on the ship shall be electrically grounded.

(b) Exterior coating on spray equipment shall be of spark-proof, nonferrous metal or nonmetallic material.

(3) Personnel Protection

(a) Personnel applying coatings and personnel working within the area shall be properly protected from the toxic effects of the solvents and clothed in such a manner as to prevent their accidentally striking a spark.

(b) Personnel preparing or applying these materials shall not carry such items as matches, cigarette lighters, or steel buckles.

(4) Exterior Applications

(a) Application of Coatings With Flash Points Below 80°F

1. Lighting. All equipment shall be grounded. Electrical equipment shall be of a type approved for Class I, Group D atmospheres in accordance with reference (g).

2. Ventilation. Normally there will be sufficient natural air movement to carry vapors away. On days when the air is still and heavy, it may be advantageous to use several large venturi-type ventilators to agitate the air.

3. Established Danger Area. The danger area will be established and roped off and posted, "Danger No Smoking or Hot Work Within 50 feet," within a 50-foot radius from the point of spraying. No welding, burning, or other hot work process involving open flames or spark-producing machines or operations shall be permitted within this area.

(b) Application of Coatings With a Flash Point of 80 to 100°F. The established danger area shall be considered to be anywhere within a 35-foot radius of the painter (20 feet from brush

applications), or from any overhead area from which sparks or glowing slag may fall.

(5) Interior Applications

(a) Regulations Common to Compartment and Tank Spray Application

1. Gas-Free Certification. A valid Gas-Free Certificate, PSNS 4730/29 (Rev. 1-91), is required for shipboard spray painting in both tanks and interior spaces.

2. Ventilation

a. Dedicated mechanical ventilation shall be used during the spray-painting evolution and during sufficient drying time to preclude buildup of an atmosphere exceeding 10% of the Lower Explosive Limit (LEL).

b. Ventilation shall remain operating until released by Gas Free Engineering personnel.

c. Exhaust must discharge to the weather at a location which avoids exposing surrounding personnel and re-circulation into the ship.

d. Ventilation equipment must be grounded to the ship.

3. Spray-Painting Equipment must be bonded/grounded to the ship.

4. Respiratory Protection. Spray painting's toxic vapor often cannot be controlled totally. Respiratory protection is also required to protect workers.

(b) Compartment Spray Application

1. Signs. "Danger Area," "No Smoking," and "No Hot Work" signs shall be posted at the boundary of the spray paint area and the ventilation exhaust discharge point.

2. Spray Application of Paints With Flash Points 100°F and Above. The danger area shall extend 35 feet from the painter in the same space or compartment (20 feet for brush applications).

3. Spray Application of Paints With Flash Points Less Than 100°F. The danger area shall extend 50 feet from the painter in the same space or compartment as the painter.

a. Lighting. Portable lighting must be explosion proof. Ship's lighting (standard hermetically sealed fluorescent lights with intact, undamaged lens covers) may be left on with precautions to ensure that they are not de-energized during painting. The lens covers should be protected from over spray by using paper or clear plastic which is fire retardant (imprinted with the label "FR").

b. Electrical Equipment. All equipment shall be non-spark producing. All induction motors and control equipment operated in the space during the spray-painting evolution shall be properly maintained and grounded. Motors and generators that have open brushes must be de-energized and protected to prevent damage. All make or break nonexplosion-proof switches shall be fixed in one position, and precautions taken to ensure that the status remains the same during the spray-painting evolution. Power cables passing through the space must be free of cracks and worn spots. Electrical junction/receptacle boxes must have all major openings protected.

c. Ventilation. Ships ventilation shall not be operated during the spray-painting evolution.

(c) Tank Spray Application

1. Lighting. Portable lighting must be explosion proof.

2. Ventilation. Non-sparking blowers shall be used. Explosion-proof motors are required where direct exposure to the solvent-bearing exhaust exits.

(d) Touch-up and Spot Painting

1. Touch-up painting danger areas shall be established the same as those for brush applications (20 feet).

2. When performing spot painting, keep clear of welders. Do not work within 15-feet overhead radius of a welder or where spillage could fall into the welder's area.

(6) Application of Other Organic Coatings and Solvents. Danger areas and hot work restrictions shall be commensurate with

the material's flash point, use rate, and method of application. Contact Code 106 to establish appropriate danger areas.

c. Servicing of Submarine Oxygen Systems. Due to the extreme potential of fire within oxygen enriched atmospheres, the following fire prevention requirements will be followed in concurrence with, and in addition to, references (i) and (j) for the charging and off-loading of submarine oxygen systems:

(1) Responsibility

(a) Project Superintendent shall:

1. Notify the Fire Division of the intent to transfer oxygen.

2. Assure that all smoking, welding, burning, grinding, and other hot work operations throughout the ship and dockside within a 50-foot radius of the transfer operation is secured and the area posted with the appropriate signs.

3. On completion of oxygen transfer, assure that the system has been certified that oxygen levels are no greater than 21% prior to allowing hot work to commence.

(b) Shipyard Oxygen Transfer Officer shall:

1. Coordinate dockside operations for the oxygen transfer. This responsibility includes arranging for setup of all dockside transfer equipment, posting of signs, installing barricades, as required, communication facilities, and inspection to assure that all safety precautions are in place.

2. Provide a mutual inspection with the ship, Gas Free Engineer, and the Fire Division, prior to the start of the oxygen transfer.

3. Provide the Project Superintendent and the ship with written certification that the transfer line and equipment have been satisfactorily cleaned, tested, and purged for oxygen service.

(c) Fire Division shall:

1. Inspect oxygen transfer area for cleanliness and fire safety precautions prior to commencing operations. Any

discrepancies found will be reported to the Shipyard Oxygen Transfer Coordinator.

2. In case of fire, explosion, or other catastrophe within the immediate area, the Fire Division shall immediately take charge of all operations on shore and when requested by the commanding officer, assist in the shipboard operations.

(2) General Fire Prevention Requirements

(a) All smoking, welding, burning, grinding, and other hot work operations and painting operations throughout the ship and dockside within a 50-foot radius of the transfer operation are secured and the area is barricaded and posted with the appropriate signs.

(b) The storage of flammable and combustible liquids within the 50-foot radius are removed.

(c) Oil or other flammable or combustible liquid spillage is cleaned up within the 50-foot radius or where it is determined to be a hazard by the Fire Division.

(d) All electrical equipment installed in the area is of a type approved by the applicable process instruction and reference (g).

(e) Ventilation is installed in accordance with the applicable process instruction.

(f) Only non-spark-producing tools are used for connections or related work.

(g) Radio antennas and unnecessary electrical equipment or equipment which fails to meet the requirements of reference (g), as well as circuits in the compartment containing the oxygen charging manifold, are de-energized.

(h) The ship's watch stander makes announcements every 15 minutes that the smoking lamp is out.

(i) Adequate carbon dioxide fire extinguishers are provided on-scene.

(j) Grounding is accomplished according to the applicable process instruction.

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